Record of Decision
Operable Unit Carbon Tetrachloride Plume

Former Fort Ord, California

November 2, 2007

United States Department of the Army
Base Realignment and Closure (BRAC)
Former Fort Ord, California

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APPENDICES

1.0 DECLARATION

1.1 Site Name and Location

The former Fort Ord is located in northwestern Monterey County, California, approximately 80 miles south of San Francisco (Plate 1). The U.S. Environmental Protection Agency (EPA) identification number for Fort Ord is CA7210020676. This Record of Decision (ROD) addresses groundwater containing volatile organic compounds (VOCs) at the former Fort Ord within the Operable Unit Carbon Tetrachloride Plume (OUCTP) (Plate 2).

1.2 Basis and Purpose

This decision document presents the selected remedial action for OUCTP groundwater in the A-Aquifer, the Upper 180-Foot Aquifer and the Lower 180-Foot Aquifer. The remedy was selected in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendment and Reauthorization Act (SARA), and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on information and reports contained in the Administrative Record for the former Fort Ord.

This decision is undertaken pursuant to the President's authority under CERCLA Section 104, as delegated to the United States Department of the Army (Army) in accordance with Executive Order 12580, and in compliance with the process set out in CERCLA Section 120. The selection of the remedies by the Army and EPA is authorized pursuant to CERCLA Section 104, and the selected remedies will be carried out in accordance with CERCLA Section 121.

The California Environmental Protection Agency (Cal/EPA), as represented by the Department of Toxic Substances Control (DTSC) and the Regional Water Quality Control Board – Central Coast Region (RWQCB), concur with the selected remedy.

1.3 Site Assessment

The response actions selected in this ROD are necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances at OUCTP into the environment.

1.4 Description of the Selected Remedy

The selected remedial alternatives described in this ROD address current or potential significant risks to human health and the environment posed by VOCs in groundwater associated with the OUCTP. The selected remedy will involve the following activities:

- A-Aquifer—In Situ Enhanced Biodegradation. This is a groundwater treatment technology that uses the injection of a liquid formula into subsurface wells within a contaminated aquifer to stimulate the growth of naturally occurring microorganisms that consume chemical contamination (such as VOCs) through naturally occurring biodegradation processes.

- Upper 180-Foot Aquifer—Groundwater Extraction and Treatment Within Operable Unit 2 (OU2) Groundwater Extraction and Treatment System.

- Lower 180-Foot Aquifer—Monitored Natural Attenuation (reduction of contaminants over time through natural processes without treatment) with Wellhead Treatment Contingency (the treatment of groundwater at the point where it is extracted for use as drinking water).

- All aquifers—Institutional controls (e.g., deed restrictions, land use controls, etc.) to prevent access or use of the groundwater within the OUCTP area for any purpose, until cleanup levels are met, and to maintain the integrity of any current or future remedial or monitoring system including monitoring, extraction, and injection wells.

1.5 Statutory Determination

The selected remedy is protective of human health and the environment, complies with federal and state requirements that are applicable or relevant and appropriate to this remedial action, is cost effective, and utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable for the OUCTP. The remedy also satisfies the statutory preference for treatment as a principal element of the remedy (i.e., reduces the toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants as a principal element through treatment).

Because the selected remedy may result in contaminants remaining within the OUCTP above levels that allow for unlimited use, a statutory review will be conducted within five years after initiation of the remedial action to ensure the remedy is, or will be, protective of human health and the environment.

1.6 ROD Data Certification Checklist

The following information is included in the Decision Summary section of this Record of Decision. Additional information can be found in the Administrative Record file for this site.

- Chemicals of concern and their respective concentrations detected in the aquifers (Table 1).

- Baseline risk represented by the chemicals of concern (Section 2.8).

- Cleanup levels established for chemicals of concern and the basis for these levels (Section 2.9).

- How source materials constituting principal threats are addressed (Section 2.12).

- Current and reasonably anticipated future land use assumptions and current and potential future uses of groundwater used in the baseline risk assessment and ROD (Section 2.7).

- Potential land and groundwater use that will be available at the site as a result of the selected remedy (Section 2.9).

- Estimated capital, annual operation and maintenance (O&M), and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected (Section 2.10).

- Key factor(s) that led to selecting the remedy (Section 2.11).

1.7 Authorizing Signatures and Support Agency Acceptance of Remedy

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Former Fort Ord, California

Craig E. College
Deputy Assistant Chief of Staff
for Installation Management

11/19/07
Date

Record of Decision
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G Youngblood 12 Oct 2007

Gail Youngblood Date
Base Realignment and Closure (BRAC) Environmental Coordinator
Fort Ord BRAC Office
U.S. Department of the Army

Record of Decision
Operable Unit Carbon Tetrachloride Plume
Former Fort Ord, California

Signature Sheet for the foregoing Record of Decision Operable Unit Carbon Tetrachloride Plume Former Fort Ord, California, among the United States Army, the United States Environmental Protection Agency, and the California Environmental Protection Agency, Department of Toxic Substances Control and California Regional Water Quality Control Board, Central Coast Region.

John D. Chatt for

Michael M. Montgomery, Chief
Federal Facilities and Site Cleanup Branch
U.S. Environmental Protection Agency
Region IX

2-6-08

Date

Record of Decision
Operable Unit Carbon Tetrachloride Plume
Former Fort Ord, California

Signature Sheet for the foregoing Record of Decision Operable Unit Carbon Tetrachloride Plume Former Fort Ord, California, among the United States Army, the United States Environmental Protection Agency, and the California Environmental Protection Agency, Department of Toxic Substances Control and California Regional Water Quality Control Board, Central Coast Region.

The State of California Environmental Protection Agency, Department of Toxic Substances Control (Cal/EPA DTSC) had an opportunity to review and comment on the Record of Decision (ROD) and our concerns were addressed.

Anthony J. Landis, P.E.
Chief
Northern California Operations
Office of Military Facilities
Department of Toxic Substances Control

11-16-07
Date

Record of Decision
Operable Unit Carbon Tetrachloride Plume
Former Fort Ord, California

Signature Sheet for the foregoing Record of Decision Operable Unit Carbon Tetrachloride Plume Former Fort Ord, California, among the United States Army, the United States Environmental Protection Agency, and the California Environmental Protection Agency, Department of Toxic Substances Control and California Regional Water Quality Control Board, Central Coast Region .

The State of California, California Regional Water Quality Control Board, Central Coast Region (RWQCB-CCR) does not agree with the table of Applicable or Relevant and Appropriate Requirements (Appendix A) as it inaccurately characterizes California Code of Regulations, Title 23, Division 3, Chapter 15 and Title 27, Division 2 as "Relevant and Appropriate" under Location-Specific Requirements and "To Be Considered" under Action-Specific Requirements. Since these are promulgated standards, we contend these are Applicable requirements in both cases.

The RWQCB-CCR had an opportunity to review and comment on the Record of Decision (ROD) and, except as stated above, our concerns were addressed.

Roger W. Briggs
Executive Officer
California Regional Water Quality Control Board, Central Coast Region

11-27-07
Date

2.0 DECISION SUMMARY

2.1 Site Description

The former Fort Ord is located near Monterey Bay in northwestern Monterey County, California, approximately 80 miles south of San Francisco (Plate 1). The former Army post consists of approximately 28,000 acres adjacent to Monterey Bay and the cities of Seaside, Sand City, Monterey, and Del Rey Oaks to the south and Marina to the north. The Union Pacific Railroad and State Route 1 pass through the western portion of former Fort Ord, separating the beachfront from the rest of the base. Laguna Seca Recreation Area and Toro Regional Park border former Fort Ord to the south and southeast, respectively, as well as several small communities such as Toro Park Estates and San Benancio. Additional information about the site:

- EPA Identification: CA7210020676
- Lead Agency: Army
- Lead Oversight Agency: EPA
- Support Agencies: DTSC and RWQCB
- Source of Cleanup Monies: Army
- Site type: former military installation.

2.2 Site History

Beginning with its founding in 1917, Fort Ord served primarily as a training and staging facility for cavalry and infantry troops. From 1947 to 1974, Fort Ord was a basic training center. After 1975, the 7th Infantry Division occupied Fort Ord. Fort Ord was selected in 1991 for decommissioning, but troop reallocation was not completed until 1993 and the base was not officially closed until September 1994. The property remaining in the Army's possession was designated as the Presidio of Monterey Annex on October 1, 1994 and subsequently renamed the Ord Military Community (OMC). Although Army personnel still operate the base, no active Army division is stationed at the former Fort Ord. Since the base was selected in 1991 for base realignment and closure (BRAC), site visits, historic and archival investigations, military munitions sampling, and removal actions have been performed and documented in preparation for transfer and reuse of former Fort Ord property. The Army will continue to retain the OMC and the U.S. Army Reserve Center located at the former Fort Ord. The remainder of Fort Ord was identified for transfer to federal, State, and local government agencies and other organizations and, since base closure in September 1994, has been subjected to the reuse process. Some of the property on the installation has been transferred. A large portion of the Inland Training Ranges was assigned to the U.S. Department of the Interior, Bureau of Land Management (BLM). Other areas on the installation have been or will be transferred through economic development conveyance, public benefit conveyance, negotiated sale, or other means.

Several CERCLA (Superfund) investigations have been conducted at the former Fort Ord that included the area now referred to as OUCTP. The initial identification of carbon tetrachloride in groundwater occurred in 1992 during sampling of monitoring wells installed in 1975 for reasons unrelated to the CERCLA investigations. The presence of carbon tetrachloride in groundwater at what is now OUCTP was first documented in the Fort Ord Landfills Preliminary Hydrogeologic Investigation *(HLA, 1990)*,

and monitoring and investigations continued under the Basewide Hydrogeologic Characterization program (*HLA, 1994*). Since the source of or use of carbon tetrachloride at the former Fort Ord was not documented as part of previous investigations, including the Basewide RI/FS (*HLA, 1995*), a separate site characterization or investigation of carbon tetrachloride in groundwater was initiated, and the results of this initial investigation were presented in the Draft Final Carbon Tetrachloride Investigation Report (*HLA, 1999*). Subsequent investigation activities and studies of OUCTP were then conducted as part of the OUCTP Remedial Investigation (OUCTP RI/FS, Volume I; *MACTEC, 2006b*) and are summarized in the Proposed Plan (*Army, 2006*).

2.3 Enforcement Activities

Environmental investigations began at the former Fort Ord in 1984 at Fritzsche Army Airfield (FAAF) under RWQCB cleanup or abatement orders 84-92, 86-86, and 86-315. Investigations indicated the presence of residual organic compounds resulting from training at the Fire Drill Burn Pit (Operable Unit 1 or OU1). The subsequent Remedial Investigation/Feasibility Study (RI/FS) for OU1 was completed in 1988, and cleanup of soil and groundwater began under RWQCB cleanup or abatement orders 86-87, 86-317, and 88-139. In 1986, further investigations began at the former Fort Ord Landfills (Operable Unit 2 or OU2) and the preliminary site characterization was completed in 1988. In 1990, the former Fort Ord was placed on the EPA's National Priorities List (NPL), primarily because of VOCs found in groundwater at OU2. A Federal Facility Agreement (FFA) was signed in 1990 by the Army, EPA, the DTSC (formerly the Department of Health Services or DHS) and the RWQCB. The FFA established schedules for performing remedial investigations and feasibility studies, and requires remedial actions be completed as expeditiously as possible, and in 1991 the basewide RI/FS began. The Army is performing these activities pursuant to the President's authority under CERCLA Section 104, as delegated to the Army in accordance with Executive Order 12580 and in compliance with the process set out in CERCLA Section 120.

2.4 Community Participation

The OUCTP RI/FS Report and Proposed Plan for the OUCTP at the former Fort Ord in Monterey County, California, were made available to the public in May 2006. The Proposed Plan presented the preferred alternative and summarized information in the OUCTP RI/FS and other documents in the Administrative Record. These documents are available to the public at the following locations:

- Seaside Branch Library, 550 Harcourt Street, Seaside, California.
- California State University Monterey Bay (CSUMB) Library Learning Complex, 100 Campus Center, Building 12, Seaside, California.
- Former Fort Ord Administrative Record, Building 4463, Gigling Road, Ord Military Community, California.

The notice of the availability of the Proposed Plan was published in the Monterey County Herald and the Salinas Californian on June 5, 2006. A public comment period was held from June 5 to July 5, 2006. An extension to the public comment period was requested. As a result, the public comment period was extended to August 4, 2006. In addition, a public meeting was held on June 14, 2006 to present the Proposed Plan to a broader community audience than those that had already been involved at the site. At this meeting, representatives from the Army, EPA, DTSC, and RWQCB answered questions about problems at the site and the remedial alternatives and the public had the opportunity to submit oral comments about the Proposed Plan. The Army also used this meeting to solicit a wider cross-section of community input on the reasonably anticipated future land use and potential groundwater uses at the site.

The Army's response to the comments received during this period is included in the Responsiveness Summary, which is part of this ROD.

2.5 Scope and Role of Response Action

This ROD addresses the planned remedial action for OUCTP groundwater, as described in the OUCTP RI/FS (*MACTEC, 2006b*). The planned remedial action for this site will be the final remedy for protection of human health and the environment. Remedial Alternative 2, which was identified in the Proposed Plan as the preferred remedial alternative, has been selected. It is summarized as follows:

Remedial Alternative 2—In Situ Enhanced Biodegradation (A-Aquifer); Groundwater Extraction and Treatment Via the Existing OU2 GWETS (Upper 180-Foot Aquifer); Monitored Natural Attenuation and Wellhead Treatment Contingency (Lower 180-Foot Aquifer).

This alternative presents:

- An in situ remediation scenario for treatment and migration control of the A-Aquifer groundwater plume via a large network of enhanced biodegradation injection points throughout the entire plume for a period of 15 years with 5 years of follow-up monitoring to assess the potential 'rebound' of chemicals of concern (COCs) above aquifer cleanup levels;

- Groundwater extraction and treatment and migration control of the Upper 180-Foot Aquifer via extraction wells and treatment within the existing Operable Unit 2 Groundwater Extraction and Treatment System (OU2 GWETS); and

- Monitored natural attenuation for a period of 30 years, with a contingency for wellhead treatment if COCs are detected in water supply wells within the Lower 180-Foot Aquifer.

This ROD addresses planned remedial actions for carbon tetrachloride (CT) and other VOCs in the OUCTP. The planned remedial actions for this site will be the final remedy for protection of human health and the environment. Proposed aquifer cleanup levels were developed for OUCTP based on (1) an assessment of Applicable or Relevant and Appropriate Requirements (ARARs) including federal and State maximum contaminant levels (MCLs); and (2) the results of the Human Health Risk Assessment (HHRA; *MACTEC, 2006b*). The groundwater cleanup standards for OUCTP are based on applicable water quality objectives and are the more stringent value of the federal and State MCLs. If the federal or State MCLs are revised for any of the COCs included in this ROD, the need for change of the applicable aquifer cleanup level will be addressed in the subsequent five-year review.

2.6 Site Characteristics

The apparent source of the OUCTP is located on what is now Lexington Court, a residential area in the northern portion of the former Fort Ord. A groundwater contaminant plume emanating from this area ultimately extends across a large area bounded by Del Monte Boulevard, Abrams Drive, Neeson Road, and Blanco Road (Plate 2). This area encompasses the lateral extent of CT detected in three different aquifers up to 550 feet below ground surface (bgs) that define the area of study in this ROD. No records exist to indicate exactly when, how often, or how much CT may have been used, stored, or disposed of; however, by delineating the areas of highest concentration in the groundwater and in the soil vapor (or "air" within the pore spaces of the unsaturated subsurface), the apparent CT disposal location has been identified. Historical practices (cleaning electronic equipment and radios) gleaned from personal interviews and the knowledge that CT was a very commonly-used solvent from the 1940's through the 1960's, lead to the hypothesis that used CT was likely disposed of to the ground over a period of years at

a former training facility in the vicinity of what is now Lexington Court, Marina. Activities associated with this facility, which is reported to have stored CT cleaning solvent in five-gallon cans, presumably included the use and disposal of CT.

Carbon tetrachloride disposed of to the soil is the suspected source of CT in soil gas and in the groundwater. To evaluate whether vapor intrusion from the sub-surface into indoor air was occurring, indoor air and soil gas data were collected in the suspected source area, as reported in the *Draft Final Report, March 2004 Indoor Air Sampling, Lexington Court, Former Fort Ord, California* (*Shaw, 2004b*). Concentrations of VOCs (including CT) in indoor air were found to be within the range of concentrations detected in ambient outdoor air, suggesting that subsurface vapors from groundwater contamination are not contributing significantly to VOCs in indoor air in residences in the vicinity of the soil source area of the OUCTP (*Shaw, 2004a, b*).

To evaluate whether vapor intrusion from the sub-surface to outdoor air was occurring in the source area, outdoor air samples were collected adjacent to the building where indoor air samples were collected. CT concentrations in outdoor air samples adjacent to the building were within the range of background concentrations measured during Fort Ord ambient air monitoring (*Shaw, 2004b*). The outdoor air exposure pathway for future resident receptors is considered potentially complete, and is qualitatively evaluated in the Human Health Risk Assessment (HHRA) and in Volume V of the RI/FS entitled "*Comments and Response to Draft Final Text, Table, Figure, Appendix A*" (*MACTEC 2006b*).

Groundwater within the OUCTP currently is not used by residents within the Fort Ord area for domestic household purposes. Groundwater within the OUCTP is located in a "Prohibition Zone" within which the installation of new supply wells is prohibited by Monterey County. According to Section 3, Subsection D of Section 15.08.140 of Chapter 15.08 of Title 15, of the Monterey County Code, a Prohibition Zone is an area overlying or adjacent to a contaminant plume where water well construction is prohibited and applications for water supply wells will not be accepted. The Prohibition Zone is identified on Plate 2. Therefore, direct contact groundwater exposure pathways for residents potentially exposed to groundwater within the OUCTP are currently incomplete and are expected to remain so in the future. For the evaluation of hypothetical future conditions, it is assumed in the HHRA that the OUCTP groundwater is used by child and adult residents in the area; therefore, all exposure pathways associated with the groundwater are considered complete for evaluation purposes only. Drinking water in the Fort Ord area is provided by the Marina Coast Water District (MCWD) and is pumped from wells that are located east of the OUCTP area screened in the Lower 180-Foot Aquifer. Based on groundwater monitoring data and data provided by the MCWD, these drinking water wells have not been impacted by contaminants related to the OUCTP (*MCWD, 2003; MACTEC, 2006a*).

2.6.1 Site Characterization

Vadose Zone Soils

The CT contamination release hypothesis presumes that after release, CT traveled through the unsaturated dune sands and entered the A-Aquifer. To confirm this hypothesis, a study of the soil vapor was conducted in the vicinity of a small storage shed or 'oily' that had been identified in aerial photos dated 1949 and 1955. This shed was located just east of a small area of an apparently residual mass of CT detected in soil vapor to depths of 80 feet below ground surface (bgs). Soil vapor surveys were performed in 1987, 2002, and March and May of 2003. Soil vapor discovered beneath the cul-de-sac of Lexington Court in 2002 has confirmed the presumed source area of CT contamination in the groundwater of the underlying A-Aquifer. The maximum concentration of CT detected in soil vapor during the surveys was 290 parts per billion by volume (ppb[v/v]). The distribution of CT concentrations were consistent both laterally and vertically and suggested increasing concentrations with depth within a

relatively small (five acre) footprint. This vertical distribution suggests that the mass represented a residual mass, not a recent or continuing one. Groundwater immediately beneath the source area contains only very low concentrations of CT, which suggests that an insufficient mass of CT remains in the vadose zone to significantly contribute to the A-Aquifer.

To assess a potential method for removing CT from soil gas, a pilot study was conducted using a soil vapor extraction system (SVE) and treatment system. A pilot SVE and treatment system was installed to evaluate the use of SVE to remediate vadose zone soils (unsaturated zone in soil between the ground surface and the water table) in the OUCTP source area (Lexington Court). Previous investigations showed that the soil gas concentrations were higher in proximity to the water table than at shallow depths. Phase I of the soil vapor extraction system was operated for 8 weeks. Three sets of samples were collected on a monthly frequency after Phase I shut down. These samples showed a slight increase in concentration (10 parts per billion); therefore the soil vapor extraction system was operated for an additional 8 weeks (Phase II). During SVE system operation 0.78 pounds of CT was removed from the vadose zone. CT soil gas data collected 6 months after the SVE and treatment system was shut down showed only low levels (an average of 0.06 parts per billion by volume) of CT concentrations. This indicated that the CT source has been removed; therefore, no additional cleanup activity was recommended for soil gas in the vicinity of Lexington Court (*Shaw, 2006*).

The potential for soil vapor intrusion from the source area and downgradient with in the OUCTP groundwater plume was evaluated in response to DTSC comments concerning the adequacy of the existing data to evaluate the indoor air pathway in the draft OUCTP Proposed Plan. DTSC requested that health risks associated with off-gassing of volatile contaminants from the OUCTP plume located downgradient of the suspected source area into indoor air be evaluated and raised concerns about the adequacy of the existing data to evaluate the indoor air pathway. A conceptual site model showing the location of monitoring wells and soil vapor sample results for CT was presented in Volume V of the Final OUCTP RI/FS (*MACTEC, 2006b*).

To address the adequacy of data available for evaluating vapor intrusion to indoor air pathway, soil vapor sampling and the Johnson and Ettinger (J&E) model was used to estimate indoor air concentrations of CT using data collected from: 1) the vadose zone source area, 2) the center and 3) the downgradient portion of the OUCTP plume, as outlined further below.

In the vadose zone source area, the J&E Model was used to estimate indoor air concentrations using soil vapor data collected immediately below the slab foundation and at 6 feet below ground surface (bgs). Indoor air concentrations were calculated for CT, 1,3-butadiene, benzene, chloroform, tetrachloroethene (PCE), and TCE, which were the only contaminants detected in either the sub-slab or 6-foot bgs soil vapor samples. The indoor air concentrations estimated by the J&E model were between 1 and 3 orders of magnitude less than the concentration of CT measured in indoor air samples. The measured indoor air CT concentrations were 0.092 parts per billion by volume (ppbv) and 0.099 ppbv and were comparable to concentrations measured in outdoor air samples adjacent to the building collected at Lexington Court (0.09 ppbv and 0.098 ppbv). Both the indoor and outdoor samples collected at Lexington Court were within the range of background concentrations 0.067 ppbv and 0.13 ppbv measured in outdoor air during the Fort Ord outdoor air monitoring. These results suggest that groundwater contamination does not appear to be a significant source of contamination to indoor air in the source area (*MACTEC, 2006b*).

In the center portion of the groundwater plume, one soil vapor sample (CTP-SGP-66) was collected and analyzed for VOCs in September 2004 at 85 feet bgs (approximately 10 feet above the water table) over the highest concentration of CT. Well MW-BW-53A had CT, TCE, and chloroform at concentrations of 13 µg/L, 4.9 µg/L, and 1.6 µg/L, respectively. The results of the soil gas sample were all non-detect for

all VOCs. This soil gas data suggest that even though the J&E model indicates potential from offgassing, actual measured concentrations of VOCs in soil gas do not demonstrate that it is present.

In the downgradient portion of the plume, the J&E Model was used to estimate indoor air concentrations using soil vapor data from monitoring well MW-BW-49A, sampled at a depth of 35 feet bgs. CT and chloroform were at concentrations of 4 µg/L and of 0.27 µg/L, respectively. The J&E model indicated a potential risk associated with the offgassing of VOCs into indoor air; however, the risk falls within the EPA and Cal/EPA-DTSC risk management range (*MACTEC, 2006b*). A summary of site risks is provided in Section 2.8.

Groundwater

A-Aquifer

The length of the CT plume in the A-Aquifer is approximately 1.6 miles, and ranges from 500 to 750 feet in width along the length of the plume. The vertical extent of the affected groundwater in the A-Aquifer is assumed to correspond with its vertical thickness of 20 to 30 feet that rests above the thick, dense clay layer known as the Fort Ord-Salinas Valley Aquitard (FO-SVA). The federal and State MCL for CT in groundwater is 0.5 µg/L, and the maximum historic detected concentration in the A-Aquifer since groundwater monitoring was initiated in 1992 was 19 µg/L. The maximum concentration of CT detected in the A-Aquifer in September 2004 was 15 µg/L.

Upper 180-Foot Aquifer

There are two narrow, parallel plumes in this aquifer. The western CT plume in the Upper 180-Foot Aquifer is approximately 0.7 miles in length and 400 feet in width. The eastern CT plume in the Upper 180-Foot Aquifer is approximately 0.9 miles in length and ranges from 200 to 600 feet in width. These plumes are migrating toward the southeast from two apparent vertical conduits through the overlying FO-SVA clay. The federal and State MCL for CT in groundwater is 0.5 µg/L, and the maximum historic detected concentration in the Upper 180-Foot Aquifer since groundwater monitoring was initiated was 9.8 µg/L. The maximum concentration of CT detected in the Upper 180-Foot Aquifer in September 2004 was 3.5 µg/L. The western plume contains low concentrations of CT (typically below 1 µg/L). The eastern plume contains slightly higher concentrations of CT than the western plume and range from the detection limit to over 5 µg/L. The vertical extent of the affected groundwater in the Upper 180-Foot Aquifer is assumed to correspond with its vertical thickness of about 60 feet, and is underlain by the Intermediate 180-Foot Aquitard, which is approximately 50 feet thick.

Lower 180-Foot Aquifer

There are two separate plumes in this aquifer. The northern CT plume in the Lower 180-Foot Aquifer is approximately 0.75 miles in length and 1,000 feet in width. The southern CT plume in the Lower 180-Foot Aquifer is defined by detections of CT at two monitoring wells approximately 0.5 miles apart that do not appear to form a continuous plume because CT has not been detected at monitoring wells in between these two wells. The federal and State MCL for CT in groundwater is 0.5 µg/L, and the maximum historic detected concentration in the Lower 180-Foot Aquifer since groundwater monitoring was initiated was 6.95 µg/L. The maximum concentration of CT detected in the Lower 180-Foot Aquifer in September 2004 was 3.6 µg/L. The vertical extent of the affected groundwater in the Lower 180-Foot Aquifer is assumed to correspond with its vertical thickness of approximately 200 feet. The Lower 180-Foot Aquifer has historically been and continues to be a significant source of potable water for the former Fort Ord and City of Marina.

2.6.2 Aquifer Characteristics

Moving from east to west the depth to the top of the groundwater in the A-Aquifer varies from as great as 120 feet to as little as 20 feet. Groundwater flow is generally to the west. Hydraulic communication between this A-Aquifer and underlying aquifers (known as the Upper 180-Foot Aquifer, the Lower 180-Foot Aquifer and the 400-Foot Aquifer in descending order) is limited to those areas west of the OUCTP where the FO-SVA clay unit pinches out, or where it has been penetrated by wells without adequate sanitary seals. Two such vertical conduits have been identified and have resulted in the migration of CT from the A-Aquifer to the underlying Upper and Lower 180-Foot Aquifers. All identified vertical conduits have been destroyed (grouted and sealed) eliminating hydraulic communication between the A-Aquifer and the underlying aquifers. Horizontal hydraulic conductivity values of this aquifer range from about 20 feet/day midway along the A-Aquifer CT plume to as high as 540 feet/day near the toe of the plume. Fine-grain sand observed near the source area suggests values less than 20 feet/day in this area.

The Upper 180-Foot Aquifer consists of about 60 feet of fine to coarse sand and some gravel and is laterally extensive throughout the OUCTP study area. Groundwater flows eastward and southeastward under largely confined conditions except within the southern portion of the OUCTP study area where the overlying FO-SVA clay rises above the potentiometric surface, thus resulting in locally unconfined conditions. The direction of flow appears controlled by the degree of hydraulic communication with the underlying Lower 180-Foot Aquifer, separated by the Intermediate 180-Foot Aquitard, where present. Where this aquitard pinches out, groundwater from the Upper 180-Foot Aquifer drains into the Lower 180-Foot Aquifer.

The Lower 180-Foot Aquifer consists of approximately 200 feet of coarse sand and gravel. The lower 180-Foot Aquifer has historically been and continues to be a significant source of potable water for the former Fort Ord and City of Marina. Significant pumping from this aquifer since the 1940's, both locally and regionally, has resulted in seawater intrusion that extends within the northern portion of the OUCTP study area. Horizontal hydraulic conductivity values have been difficult to determine, given waste discharge limitations, but have been successfully simulated at 700 feet/day. This aquifer is the local equivalent of the regional 180-Foot Aquifer and passive groundwater elevation monitoring clearly illustrates seasonal and daily pumping cycles from irrigation wells located in the Salinas Valley, east of the OUCTP study area.

Pumping from the Salinas Valley has reversed the direction of flow within the Upper 180-Foot and Lower 180-Foot Aquifer. Beneath the site, groundwater in the Upper 180-Foot Aquifer flows to the southeast toward the apparent edge of the underlying Intermediate 180-Foot Aquitard where it then recharges the Lower 180-Foot Aquifer. Groundwater primarily migrates to the east in the Lower 180-Foot Aquifer but oscillates between a northeast direction in the summer (in response to increased pumping from the Salinas Valley) and a more southeast direction (locally in response to the Marina Coast Water District [MCWD] Well Nos. 29, 30, and 31).

No contamination has been observed in the 400-Foot Aquifer wells and no CT has been detected in the active drinking water wells serving the Fort Ord community.

2.6.3 Groundwater Modeling

A numerical simulation of groundwater flow (MODFLOW-2000) was constructed to substantiate the preceding contamination flow hypothesis. It incorporates lithologic data, groundwater elevation data, and contaminant concentrations to represent the dynamic interaction of seasonal recharge, current pumping, and natural conditions with the migration of CT through the A-Aquifer, Upper 180-Foot Aquifer, and the

Lower 180-Foot Aquifer. Particle pathlines (MODPATH) were used to represent the axes of each plume and illustrate the rate of groundwater migration. This analysis generally indicates that groundwater requires approximately 20 years to travel from the CT source area to the downgradient extent of the CT plume (*MACTEC, 2006b*). Particle pathlines were also used to evaluate the effectiveness of groundwater extraction remedial alternatives. Finally, a mass transport model was constructed to account for dispersion of the CT plume and evaluate various remedial alternatives. Results indicate that approximately 50 years are required to attain the current distribution of CT in the A-Aquifer, which is consistent with the conceptual model. The apparent retardation factor of 2.5 represents dispersion, as chemical reactions were not simulated.

2.7 Current and Potential Future Land and Resource Uses

Land Uses

Current onsite land use within the OUCTP study area includes, primarily, residential, light industrial and commercial development, and natural habitat reserve areas. The current land use of the surrounding area consists also of residential, light industrial and commercial development, and natural habitat reserve areas. Land use in areas that are currently developed will remain so in the future. Planned land uses in the OUCTP study area on the former Fort Ord and transferred former Fort Ord property are based primarily upon the Fort Ord Reuse Authority (FORA) March 1997 Fort Ord Base Reuse Plan (*FORA, 1997*) and the July 1995 USACE and Bureau of Land Management (BLM) Site Use Management Plan (SUMP) (*USACE, 1995*). Other sources of future land use information were provided in public benefit conveyance, negotiated sale requests, and transfer documents, and in the *Installation-Wide Multi-Species Habitat Management Plan for Former Fort Ord, California* (HMP) (*HLA, 1997*). The Reuse Plan identified approximately 20 land use categories at the former Fort Ord (*FORA, 1997*) including habitat management, open space/recreation, institutional/public facilities, commercial, industrial/business park, residential, tourism, mixed use, and others.

The HMP presents the revised boundaries of the habitat reserve areas and describes special land-use controls and habitat monitoring requirements for target species within the HMP reserve and development areas. The HMP confirms locations of low-intensity use such as the HMP reserve areas; it also specifies an allowance for development within the reserve areas for public access support facilities in as much as 2 percent of the area.

Groundwater Uses

As described in Section 2.6 the use of Groundwater from OUCTP is currently prohibited from use for any purpose. Groundwater at OUCTP is considered a potential drinking water, industrial water and agricultural water source under the Basin Plan (*RWQCB, 1994*). One of the objectives of the remedial action is to restore the uses of groundwater within and adjacent to OUCTP in 20 years.

2.8 Summary of Site Risks

Potential human health risks from exposure to VOCs detected in groundwater and soil gas within OUCTP were evaluated in the HHRA using groundwater and soil gas data collected at the site (*MACTEC, 2006b*). The HHRA estimates what risks the site would pose if no action were taken. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. This section of the ROD summarizes the results of the baseline risk assessment for the OUCTP. A detailed discussion of the risk assessment evaluation is provided in Volume II and in the Response to Agency Comments (Volume V) of the OUCTP RI/FS (*MACTEC, 2006b*). The HHRA was conducted in accordance with EPA, Cal/EPA-DTSC, and USACE guidance.

In evaluating the risks associated with direct exposure to groundwater contamination it is noted that the groundwater exposure pathway is incomplete because of the existing prohibition on groundwater use, but that there is a potential risk to residents due to carbon tetrachloride volatilization from groundwater and intrusion into indoor air. The estimated risk is based on a theoretical model that uses simplified, but conservative assumptions regarding site conditions and exposure scenarios. The estimated risk associated with indoor air intrusion from CT in groundwater appears to be a minor contribution to the total inhalation risk when compared to the risk associated with measured chemical concentrations in the regional ambient air. Measurements of soil gas concentrations are required to provide confirmation of the results predicted by the model using groundwater data. Regarding the contribution of CT contamination to indoor air levels, the measurements will be conducted before groundwater remediation begins to assess present soil gas concentrations. Should modeling of indoor air concentrations, based on the soil gas sampling predict elevated levels of CT, indoor air sampling will be conducted and further soil gas sampling will be conducted during remediation, to assess how the soil gas concentrations change in response to remedial activities.

An ecological risk assessment was not conducted for OUCTP because no plants and animals were identified as potentially being directly exposed to VOCs in groundwater present below the ground surface in the aquifers associated with OUCTP. Potential inhalation exposure to VOCs from volatilization of groundwater was not evaluated for burrowing animals. Risks to the environment were not specifically assessed except for the extent to which implementation of the alternatives may have impacts on potential ecological receptors (e.g., if a groundwater extraction and treatment system were to be located in an ecologically sensitive area).

The Risk Assessment addressed the potential excess cancer and noncancer risks to future onsite child and adult residents posed by detected chemicals present in groundwater and soil gas (irrespective of cleanup levels) in accordance with regulatory agency guidance. For the indoor air evaluation, all chemicals detected in soil gas were quantitatively (statistically) evaluated in the Risk Assessment. For the groundwater evaluation, only chemicals selected as chemicals of potential concern were evaluated in the Risk Assessment. Potential risks to children and adult residents were evaluated assuming that they could potentially be exposed via two pathways, although both pathways are incomplete, as described below.

The first exposure pathway assumed the use of contaminated groundwater for household purposes such as showering and bathing, and as a source of drinking water. This pathway is incomplete because groundwater from the OUCTP area is not currently supplied for domestic use, and the installation of new wells at the former Fort Ord is restricted under Monterey County Ordinance No. 04011, dated April 1999. Therefore, the estimated risks from groundwater contaminants are based on a hypothetical scenario under which an individual installs a private drinking water well without authority, permit, or approval, and uses it exclusively for their drinking and household water purposes.

The second exposure pathway assumed inhalation of VOCs in the soil vapor phase after volatilization from the groundwater table. The DTSC version of the J&E model was used to simulate potential risk from CT volatizing from the plume surface, although laboratory analytical results were also reviewed from samples of: 1) soil gas above the groundwater "hot spot," and 2) indoor air above the CT source area. The available laboratory analytical data suggests that CT in the vapor phase is not reaching the ground surface likely due to heterogeneities in soil type. The full evaluation of these direct analytical results is provided in Appendix V of the RI/FS. The RI/FS identified that: 1) one soil vapor sample collected at a depth of 85 feet below ground surface (bgs) was non-detect for all VOCs and was located immediately above the highest concentration of VOCs in groundwater (Well MW-53 at 7.4 µg/L); 2) indoor air samples collected above the soil source area were below background concentrations.

The results of the J&E model simulated an excess cancer risk of 2 in 100,000. While this estimated cancer risk is greater than point of departure for risk management of 1 in 1,000,000, it is within the risk management range of 1 in 1,000,000 to 1 in 10,000. The input assumptions used in the J&E model were conservative because: 1) the actual average groundwater concentration of CT within the plume area is approximately half of that used in the model (1-2 µg/L); 2) the exposure period will likely be less than 30 years because the groundwater plume will be remediated within approximately 10 years; and 3) the vapor phase CT is not likely reaching the ground surface as indicated by the soil vapor and indoor air analytical results mentioned above. When remediation of groundwater is completed in accordance with this ROD, the J&E model estimates an excess cancer risk of only 1.8 in 1,000,000. This post-remediation J&E model result shows that even if CT volatilizes from groundwater and reaches the ground surface, the long-term risk is at the point of departure for risk management of 1 in 1,000,000. Based on this risk evaluation, direct remediation of the vapor intrusion pathway is not required, because when the groundwater is remediated, the source of CT to the unsaturated zone will be removed.

Cancer risks were estimated and were compared to regulatory risk management values as follows:

- *Reasonable Maximum Exposure (RME):* For the RME scenario, it was assumed that an onsite resident would be exposed to VOCs through domestic use of groundwater and from vapor intrusion to indoor air from soil gas and groundwater 350 days per year for a total duration of 30 years (both during childhood and as an adult). Contamination in the A-Aquifer was associated with the highest estimated cumulative excess cancer risk from all pathways, including vapor intrusion from groundwater to indoor air by using risk values calculated based on the J&E model simulations as described above (3 in 100,000); followed by the Upper 180 Foot-Aquifer (2 in 100,000); and then the Lower 180-Foot Aquifer (2 in 100,000). The estimated excess cancer risk from direct contact with groundwater was 1 in 100,000 in the A-aquifer; 3 in 1,000,000 in the Upper 180 Foot-Aquifer and 2 in 1,000,000 in the Lower 180-Foot Aquifer.

- *Comparison to Regulatory Risk Management Values*: These cumulative excess cancer risk estimates are within the EPA and Cal/EPA-DTSC cancer risk management range of "1 in 10,000" to "1 in 1,000,000", and are above Cal/EPA-DTSC's point of departure for risk management of "1 in 1,000,000". An excess cancer risk of "1 in 10,000" means that an exposed individual may have an added 1 in 10,000 chance of developing cancer over a lifetime than would an unexposed individual. An excess cancer risk of "1 in 1,000,000" means that an exposed individual may have an added 1 in 1,000,000 chance of developing cancer over a lifetime than would an unexposed individual.

Noncancer risks were estimated for and were compared to regulatory risk management values as follows:

- *Reasonable Maximum Exposure (RME)*: For the RME scenario, it was assumed that an onsite resident would be exposed to VOCs through domestic use of groundwater and from vapor intrusion to indoor air from soil gas and groundwater 350 days per year for a total duration of 30 years (both during childhood and as an adult). The total RME hazards estimated for the three aquifers for the adult resident, and child resident did not exceed 1.0 Hazard Index (HI).

- *Comparison to Regulatory Risk Management Values*: These cumulative noncancer hazard estimates are below the acceptable noncancer regulatory Hazard Index (HI) of one (1.0) for both exposure scenarios and all three groundwater remedial units (aquifers).

The estimated cancer risk for the groundwater was 2 in 100,000. While within the risk management range of CERCLA, groundwater impacted by VOCs would be remediated to comply with ARARs.

As per CERCLA, all relevant human health risks and hazards are acceptable, thereby not necessitating a remedial action on risk grounds.

2.9 Remedial Action Objectives

The primary Remedial Action Objectives (RAO) for OUCTP groundwater impacted by VOCs is to comply with ARARs such as federal and State laws and regulations. There is no unacceptable human health risk that has been demonstrated since the exposure pathway for contaminated groundwater is not complete. Restricting access to contaminated groundwater and remediating the contaminated groundwater are both necessary to assure that the pathway does not become complete. Groundwater at OUCTP, it is important to note, is designated as a drinking water, industrial water, and agricultural water source under the Basin Plan (*RWQCB, 1994*), but is not currently being used for these purposes. Achievement of the RAOs will restore the uses of groundwater within and adjacent to OUCTP.

Cleanup levels are acceptable contaminant levels that, when achieved within a site, would reduce potential risks and comply with ARARs. Proposed aquifer cleanup levels were developed for OUCTP based on (1) an assessment of ARARs including federal and State MCLs for groundwater; and (2) the results of the HHRA (OUCTP RI/FS, Volume II; *MACTEC, 2006b*).

The chemicals of concern (COCs) and proposed aquifer cleanup levels for each of the three aquifers in OUCTP were identified as follows:

- COCs were identified based on their concentration, frequency of detection, toxicity, and an assessment of their contribution to cumulative risks assessed in the HHRA.

- Federal and State drinking water MCLs were reviewed for each COC detected in groundwater within OUCTP. The groundwater cleanup standards for OUCTP are based on applicable water quality objectives and are the more stringent value of the federal and State MCL. The more conservative or lower of the federal or State MCLs for each COC within the OUCTP plume were selected as aquifer cleanup levels because total risks estimated in the HHRA are within regulatory risk management ranges, and MCLs are enforceable standards for chemicals in drinking water that may affect public health. In order to be consistent with other RODs at Fort Ord, aquifer cleanup levels for chloroform and vinyl chloride were derived from a risk-based calculations in the *Final Feasibility Study Report* (*Dames and Moore, 1993*).

The COCs were examined separately for the three groundwater aquifer zones. The COCs associated with each aquifer are as follows:

- A-Aquifer: CT, TCE, and PCE

- Upper 180 Foot-Aquifer: CT

- Lower 180-400 Foot-Aquifer: 1,2-dichloroethane (1,2-DCA) and CT.

The COCs and aquifer cleanup levels for each of the three aquifers in OUCTP are presented in Table 1. For each of these COCs, Table 1 presents regulatory levels, maximum concentrations detected in each of the aquifers, and the treatment system discharge levels.

Although not identified as COCs in the OUCTP RI/FS, because they were either not detected in the A-Aquifer or were determined to not be major risk drivers based on the results of the HHRA, the compounds chloroform, dichloromethane, 1,1-dichloroethylene (DCE), 1,2-dichloroethylene (1,2-DCE),

and vinyl chloride are included in Table 1. The compounds were added to Table 1 because there is the potential that they may be produced as by-products from the COCs present in the A-Aquifer during in situ enhanced bioremediation (by-products associated with the reductive biotransformation).

2.10 Description of Alternatives

Remedial alternatives were assembled in the OUCTP Feasibility Study (FS; OUCTP RI/FS, Volume III) to provide a logical and comprehensive approach for cleanup of all three aquifers based on the results of the remedial technology screening (*MACTEC, 2006b*). For the purposes of the Feasibility Study evaluation, the most effective remedial technologies were assembled into stand-alone full-scale remedial alternatives for each of the three groundwater remedial units (aquifers) based on their ability to achieve Aquifer cleanup levels throughout the entire plume. Access limitations to portions of the plume located in developed or ecologically sensitive areas where it would be difficult to install and operate equipment were considered during the remedial alternative evaluation. The remedial alternatives considered for OUCTP include:

- Remedial Alternative 1—No Action With Monitoring (All Aquifers).
- Remedial Alternative 2—In Situ Enhanced Biodegradation (A-Aquifer); Groundwater Extraction and Treatment Within OU2 Groundwater Treatment and Extraction System (Upper 180-Foot Aquifer); Monitored Natural Attenuation with Wellhead Treatment Contingency (Lower 180-Foot Aquifer).
- Remedial Alternative 3—In Situ Permeable Reactive Barrier (A-Aquifer) (In situ permeable reactive barriers are composed of a material that passively removes contaminants from flowing groundwater); Groundwater Extraction and Treatment Within OU2 Groundwater Extraction and Treatment System (Upper 180-Foot Aquifer); Monitored Natural Attenuation with Wellhead Treatment Contingency (Lower 180-Foot Aquifer).
- Remedial Alternative 4—Groundwater Extraction and Treatment (A-Aquifer); Groundwater Extraction and Treatment Within OU2 Groundwater Extraction and Treatment System (Upper 180-Foot Aquifer); Monitored Natural Attenuation with Wellhead Treatment Contingency (Lower 180-Foot Aquifer).

All of the alternatives include common components summarized as follows:

- Monitoring of up to 30 additional wells for 30 years.
- Monitored natural attenuation of the Lower 180-Foot Aquifer with a contingency plan for well-head treatment of groundwater being extracted from potable water supply wells if COCs associated with OUCTP are detected above the aquifer cleanup levels in these wells.
- Institutional controls (e.g., deed restrictions, land use controls, etc.) to prevent access or use of the groundwater within the OUCTP area for any purpose, until cleanup levels are met, and to maintain the integrity of any current or future remedial or monitoirng system including monitoring, extracton, and injection wells.

Property overlying and surrounding the OUCTP is within the "Prohibition Zone" of the "Special Groundwater Protection Zone." The Prohibition Zone is identified on the Former Fort Ord "Special Groundwater Protection Zone Map," which is on file with the County of Monterey, and shown on Plate 2. As an additional institutional control, a federal deed restriction and a land use covenant prohibiting the use of groundwater in all aquifers will be established between the Army and the State of California

(DTSC and the California Regional Water Quality Control Board, Central Coast Region [RWQCB]) as part of the remedy. County Ordinance No. 04011 prohibits construction of water wells within the Prohibition Zone. Land use controls (LUCs) will be maintained until the chemical concentrations in the groundwater are at such levels that allow for unrestricted use and exposure (approximately 15 years). Prior to transfer, the Army is responsible for implementing, maintaining, and reporting on the LUCs, and Army will include the restrictions selected in the ROD for property currently owned by the Army in the federal deed. The restrictions will also be embodied in a State Covenant to Restrict the Use of Property (CRUP). After transfer, the new owner(s) will take on day-to-day responsibility for LUC management, oversight and reporting. Detailed procedures on LUC management, oversight and reporting requirements will be developed in connection with the RD/RA Workplan. Both the State and Army will maintain enforcement roles over LUCs. Post-transfer, the Army will retain residual CERCLA liability to maintain its remedy and so will be responsible for the enforcement of LUCs embodied in the federal deeds should LUC problems affect the Army's remedy. The State will exercise its enforcement authorities as provided for in the CRUP. The Army is also responsible for maintaining and reporting on the Prohibition Zone and Monterey County is responsible for enforcement of the Prohibition Zone. Although the Army may later transfer, or in some cases has transferred, these procedural responsibilities to another party by contract, property transfer agreement, or through other means, the Army shall retain the ultimate responsibility for remedy integrity. Table 2 includes a list of former Fort Ord parcels overlying the OUCTP, transfer status of the parcels, the transfer document that includes the parcel, whether or not a land use covenant is currently in place, and the property recipient or intended recipient if the parcel has not transferred. The parcels overlying the OUCTP are shown on Plate 3.

Alternatives 2 to 4 were developed based on the following considerations for the A-Aquifer and Upper 180-Foot Aquifer, respectively:

- A-Aquifer: Portions of the plume are located under roadways, heavily developed commercial areas, and ecologically sensitive areas where it would be difficult to install and operate permanent wells, piping, and treatment system equipment. In addition, there is variability in groundwater conditions and in the applicability of certain remedial technologies evaluated in portions of the plume. Therefore, for the purposes of the Feasibility Study evaluation, the location of the treatment systems included in Alternatives 2 to 4 were selected based on accessibility and other logistical considerations (*MACTEC, 2006b*). These assumptions will be refined during the remedial design phase of remedy implementation.

- Upper 180-Foot Aquifer: Cleanup of this aquifer under Alternatives 2 – 4 would be the same and would be accomplished by adapting the OU2 Groundwater Extraction and Treatment System, which is already in place and treating groundwater from OU2, to also cleanup the VOC plume associated with OUCTP. These alternatives assume that newly installed groundwater extraction wells (EW-OU2-07-180 and EW-OU2-08-180) and potential future extraction wells would be pumped for capture of the majority of the Upper 180-Foot Aquifer plume.

The unique components of the A-Aquifer remedial alternatives are summarized as follows:

Remedial Alternative 1—No Action With Monitoring (All Aquifers). The no action alternative is required as a baseline for comparison to other alternatives (EPA, 1989), and assumes the common components listed above plus the following:

- The plume(s) would naturally attenuate over a period of approximately 30 years to meet cleanup goals (RAOs), and chemical concentrations in groundwater and offsite plume migration would not increase in a statistically significant manner.

- Costs associated with planning and installing up to 30 additional monitoring wells to bound the plumes are estimated at approximately $0.6 million. Operations and maintenance costs for 30 years of monitoring and reporting are estimated at $2.4 million, for a total estimated cost for this alternative of $3.9 million. Costs associated with contingent wellhead treatment of water supply wells in the Lower 180-Foot Aquifer if COCs are detected in these wells would be estimated during the remedial design phase for implementation of the selected alternative.

Remedial Alternative 2—In Situ Enhanced Biodegradation (A-Aquifer); Groundwater Extraction and Treatment Within OU2 Groundwater Extraction and Treatment System (Upper 180-Foot Aquifer); Monitored Natural Attenuation with Wellhead Treatment Contingency (Lower 180-Foot Aquifer).

This alternative includes the common components listed above and presents an in situ remediation scenario for treatment and migration control of the A-Aquifer groundwater plume using a network of in situ enhanced biodegradation injection points throughout the entire plume. In order to address accessibility and other logistical considerations described above, it was assumed injection equipment would be used that requires only temporary access to the ground surface, and no permanent equipment would be installed. The components of this alternative for the A-Aquifer are described below.

- Sodium lactate or a similar solution would be injected until concentrations of COCs in the A-Aquifer are at or below aquifer cleanup levels. Sodium lactate is a natural salt derived from lactic acid, which is a product of natural fermentation in foods such as cheese and yogurt. The groundwater would be monitored for the COCs and their breakdown products during the cleanup.

- Costs associated with installing the injection and recirculation treatment system and additional monitoring wells, and conducting the first injection event, are estimated at approximately $4.99 million. Treatment system operations and maintenance costs for 20 years of monitoring and reporting and subsequent demolition are estimated at approximately $10 million, for a total estimated cost for this alternative of $15.04 million.

Remedial Alternative 3—In Situ Permeable Reactive Barrier (A-Aquifer); Groundwater Extraction and Treatment Within OU2 Groundwater Extraction and Treatment System (Upper 180-Foot Aquifer); Monitored Natural Attenuation with Wellhead Treatment Contingency (Lower 180-Foot Aquifer).

This alternative includes the common components listed above and presents a remediation and containment approach that includes installation of an in situ permeable reactive barrier (PRB). To address accessibility and other logistical considerations described above, it was assumed the PRB would be located at the downgradient end of the plume on former Fort Ord property. The components of this alternative for the A-Aquifer are described below.

- If the results of a pilot study indicate a PRB would be effective, a full-scale PRB would be installed.

- The full-scale in situ PRB would be installed near the downgradient plume boundary for offsite migration control of the A-Aquifer plume.

- Groundwater modeling indicated the PRB would clean up the majority of the carbon tetrachloride plume upgradient of the PRB within 50 years, with only a small portion of the plume remaining at concentrations ranging from 0.5 to 1.5 ppb. However, groundwater downgradient of the PRB would remain contaminated at concentrations ranging between 0.5 and 5 ppb due either to the continued migration of carbon tetrachloride already present downgradient of the PRB, or from residual carbon tetrachloride emanating from the PRB (the aquifer cleanup level for carbon tetrachloride is 0.5 ppb). Therefore, it is anticipated designation of a containment zone may be required for this area since it

would contain COCs above aquifer cleanup levels for an undetermined period. A containment zone is an area of limited groundwater contamination where aquifer cleanup levels cannot be met in a reasonable period.

- Costs associated with installing the PRB and additional monitoring wells are estimated at approximately $9.4 million. Operations and maintenance, and monitoring and reporting costs for 30 years, plus demolition, are estimated at approximately $9.53 million, for a total estimated cost for this alternative of $18.93 million.

Remedial Alternative 4—Groundwater Extraction and Treatment (A-Aquifer); Groundwater Extraction and Treatment Within OU2 Groundwater Extraction and Treatment System (Upper 180-Foot Aquifer); Monitored Natural Attenuation with Wellhead Treatment Contingency (Lower 180-Foot Aquifer).

This alternative includes the common components listed above and presents an approach that includes pumping groundwater from the A-Aquifer plume with aboveground treatment and injection of treated water back into the aquifer. In order to address accessibility and other logistical considerations described above, it was assumed permanent extraction wells and treatment system piping and equipment would be located within the boundaries of the former Fort Ord in easily accessible areas. The components of this alternative for the A-Aquifer are described below.

- Five groundwater extraction wells would be installed for capture of the majority of the A-Aquifer plume. The extracted water would be collected at an aboveground groundwater treatment plant, and would be treated and injected back into the aquifer.

- A portion of the downgradient plume would not be technically feasible to capture because, based on the groundwater modeling simulation, any increase in the estimated pumping rate above 50 gallons per minute (gpm) would dry up the well. Current development in the vicinity of the proposed well will not allow relocation to a more suitable area. Concentrations of carbon tetrachloride in the downgradient (uncaptured) portion of the plume are estimated to range from between 0.5 to 5 ppb based on current plume conditions (the aquifer cleanup level for carbon tetrachloride is 0.5 ppb). It is assumed the contaminants in this part of the plume would be cleaned up naturally over time (natural attenuation).

- Although concentrations of COCs in the downgradient portion of the plume are expected to decline over time through natural attenuation processes, it is anticipated designation of a containment zone may be required for this area since the contaminants would be above the cleanup levels for an undetermined period.

- The extracted groundwater would be treated to meet the cleanup goals and would be injected back into the aquifer through wells located within the plume to increase the flow toward the extraction wells.

Costs associated with installing the extraction, treatment, and injection system and additional monitoring wells are estimated from $2.57 to $2.65 million, depending on whether activated carbon or air stripping treatment is selected for implementation during the remedial design phase. Treatment system operations and maintenance costs for 30 years of monitoring and reporting as well as demolition are estimated from $16.68 to $23.58 million, depending on the treatment method, for a total estimated cost for this alternative of $19.25 to $26.22 million.

2.11 Principal Threat Wastes

The source material constituting the principal threats in the OUCTP is groundwater-containing VOCs, primarily CT, at concentrations that exceed federal and state drinking water MCLs. The remedial alternative will address the threat through in situ enhanced biodegradation in the A-Aquifer; groundwater extraction and treatment within the existing OU2 GWETS in the Upper 180-Foot Aquifer; and monitored natural attenuation with wellhead treatment contingency in the Lower 180-Foot Aquifer.

2.12 Selected Remedy

2.12.1 Summary of the Rationale for the Selected Remedy

This section summarizes and presents the rationale for selection of the identified preferred remedial alternative for implementation within OUCTP based on the evaluation and comparison of alternatives presented in Section 2.10.

Each alternative for OUCTP groundwater was assessed against the nine EPA evaluation criteria described in Table 3. Using the results of this assessment, the Army compared the alternatives and selected a remedy for OUCTP. The remedy that best meets the nine EPA evaluation criteria is Remedial Alternative 2. This remedy was selected because it is the only alternative that would: (1) cleanup COCs in the entire A-Aquifer and Upper 180-Foot Aquifer plumes to concentrations that are at or below aquifer cleanup levels within the shortest timeframe for the lowest associated cost, while (2) protecting human health and the environment and complying with ARARs, such as federal, State and local laws and regulations. It also provides long-term Monitored Natural Attenuation and contingent wellhead treatment at water supply wells in the Lower 180-Foot Aquifer if COCs are detected in these wells. In order to fully capture and treat OUCTP groundwater in all three aquifers, modifications to the remedial design including the addition of groundwater or lactate injection and/or extraction wells may be necessary if the boundaries of the plume are found to have changed significantly from those defined in the OUCTP RI/FS.

The selected remedy may be modified in response to public or regulatory agency comments, or new information that is identified during the remedial design phase of remedy implementation.

The State of California (DTSC and RWQCB) concurs with the selection of Alternative 2. Community acceptance is discussed in the responsiveness summary (Section 3.0). Details regarding groundwater remedial actions under the selected remedy are presented below.

2.12.2 Description of the Selected Remedy

Remedial Alternative 2, which was identified in the Proposed Plan as the preferred remedial alternative, has been selected. It is summarized as follows:

Remedial Alternative 2—In Situ Enhanced Biodegradation (A-Aquifer); Groundwater Extraction and Treatment Via the Existing OU2 Groundwater Extraction and Treatment System (GWETS) (Upper 180-Foot Aquifer); No Action with Monitored Natural Attenuation and Wellhead Treatment Contingency (Lower 180-Foot Aquifer):

This alternative presents: (1) an in situ remediation scenario for treatment and migration control of the A-Aquifer groundwater plume via a large network of in situ enhanced biodegradation injection points throughout the entire plume for a period of 15 years with 5 years of follow-up monitoring to assess the potential 'rebound' of COCs above aquifer cleanup levels; (2) groundwater extraction and treatment and migration control of the Upper 180-Foot Aquifer via extraction wells and treatment within the existing

OU2 GWETS; and (3) monitored natural attenuation of all three aquifers for a period of 30 years, with a contingency for wellhead treatment if COCs are detected in water supply wells within the Lower 180-Foot Aquifer.

Remedial Alternative 2 includes institutional controls (e.g., deed restrictions, land use controls, etc.) to prevent access or use of the groundwater within the OUCTP area for any purpose, until cleanup levels are met, and to maintain the integrity of any current or future remedial or monitoring system including monitoring, extraction and injection wells.

The remedy includes a land use control, (Monterey County Ordinance 04011 [currently in effect]) that prohibits the drilling of new water wells within the "Prohibition Zone", and a land use covenant prohibiting the use of groundwater in all aquifers beneath the OUCTP. Prohibitions on the extraction or use of groundwater will be embodied in the federal deed(s) as well as in a Covenant to Restrict the Use of Property (CRUP). A CRUP will be established for the parcels in the Prohibition Zone surrounding the OUCTP area between the Army and the State of California (DTSC and the RWQCB) prior to transfer. Land use controls (LUCs) will be maintained until the chemical concentrations in the groundwater are at such levels that allow for unrestricted use and exposure (approximately 15 years). Prior to transfer, the Army is responsible for implementing, maintaining, and reporting on the LUCs, and Army will include the restrictions selected in the ROD for property currently owned by the Army in the federal deed. The restrictions will also be embodied in a State CRUP. After transfer, the new owner(s) will take on day-to-day responsibility for LUC management, oversight and reporting. Detailed procedures on LUC management, oversight and reporting requirements will be developed in connection with the RD/RA Workplan. Both the State and Army will maintain enforcement roles over LUCs. Post-transfer, the Army will retain residual CERCLA liability to maintain its remedy and so will be responsible for the enforcement of LUCs embodied in the federal deeds should LUC problems affect the Army's remedy. The State will exercise its enforcement authorities as provided for in the CRUP. The Army is also responsible for monitoring and reporting on the Prohibition Zone and Monterey County is responsible for enforcement of the Prohibition Zone. Although the Army may later transfer, or in some cases has transferred, these procedural responsibilities to another party by contract, property transfer agreement, or through other means, the Army shall retain the ultimate responsibility for remedy integrity. A land use control remedial design will be prepared as the land use component of the remedial design. In accordance with the FFA schedule, the Army shall prepare and submit to EPA for review and approval a land use control remedial design that shall contain implementation and maintenance actions, including periodic inspections.

A-Aquifer

The effectiveness of in situ enhanced biodegradation via injection and recirculation of a liquid formula (e.g., sodium lactate or a similar solution) in reducing CT concentrations in the A-Aquifer has been demonstrated in site-specific bench-scale and pilot treatability studies (*MACTEC, 2006b*). The groundwater modeling simulation of this alternative indicated it would be effective in containing and remediating the A-Aquifer CT-plume to below aquifer cleanup levels within a time period of approximately 15 years, with 6 injection events occurring approximately every 2.5 years.

The results of the groundwater modeling for this scenario simulated the dechlorination of CT under favorable chemical conditions induced by the addition of an electron donor such as lactate in sufficient quantity and number of locations to remediate the A-Aquifer CT plume summarized as follows:

- A line of in situ enhanced biodegradation injection locations that span the width of the plume aligned perpendicular to groundwater flow.

- The majority of the in situ enhanced biodegradation injection points would be installed to a depth of approximately 100 feet bgs as permanent 4-inch diameter recirculation wells (as were demonstrated to be effective in the pilot biotreatability study) that would aid in the distribution of sodium lactate or a similar solution throughout the aquifer and could be reinjected as often needed to maintain favorable biodegradation rates within the aquifer.

- The remainder of injection points located in the portion of the plume that has migrated offsite into the City of Marina (referred to as the downgradient 'toe of the plume') would be installed using alternative techniques due to constraints on installing and constructing permanent wells and an aboveground treatment system within developed areas.

- Periodic injection of a liquid formula (e.g., sodium lactate or a similar solution) at each injection point until concentrations of COCs are at or below aquifer cleanup levels (approximately 15 years, or approximately 6 injection events).

- Up to 30 additional "point of compliance" monitoring wells would be installed to provide additional monitoring locations that would trigger reassessment of the remedy or implementation of a contingency plan if COCs are detected in water supply wells in the Lower 180-Foot Aquifer. A contingency plan would be developed for well-head treatment of groundwater (via activated carbon or air stripping) being extracted from potable water supply wells if COCs associated with OUCTP (Table 1) are detected in these wells.

- Treatment system monitoring would be conducted for VOCs and natural attenuation parameters throughout the duration of treatment (15 years) and an additional 5 years of follow-up monitoring to assess the potential for concentrations of COCs to 'rebound' after treatment is discontinued, for a total duration of 20 years. Groundwater monitoring of the OUCTP MWs would be conducted for a period of 30 years.

- Natural attenuation indicator data would be analyzed to gauge the level of enhanced biodegradation within the aquifer and determine the need for and estimate the time between lactate reinjection events.

- Capital costs associated with installing the in situ enhanced biodegradtion injection points and recirculation treatment system and additional monitoring wells, and conducting the first injection event are estimated at approximately $4.99 million. Treatment system operations and maintenance costs for 15 years and 20 years of monitoring and reporting and subsequent demolition are estimated at approximately $10 million, for a total estimated 20-year NPV cost of $15.04 million. These cost estimates were revised from the $9.54 million that was originally estimated in the OUCTP RI/FS . (*MACTEC, 2006b*).

Upper 180-Foot Aquifer

This alternative presents a containment approach that includes a pumping scenario for migration control of the groundwater plume with aboveground treatment and reinjection of treated water back into the aquifer. This alternative assumes the newly installed groundwater extraction well (and potential future extraction wells) that is a component of the optimized OU2 GWETS would be pumped for capture of the majority of the Upper 180-Foot Aquifer plume (*MACTEC, 2006b*). The extracted water would be collected and treated at the existing aboveground central process and control area of the OU2 GWETS.

The results of the groundwater modeling simulation of this alternative indicated it would be effective in containing and remediating the majority of the Upper 180-Foot Aquifer plume to below aquifer cleanup levels within a time period of approximately 30 years as follows:

- The newly installed groundwater extraction well and potential future extraction wells would be pumped for capture of the majority of the Upper 180-Foot Aquifer plume. Optimization procedures would need to be implemented within the OU2 GWETS to incorporate additional flow into the current treatment system.

- The extracted groundwater would require treatment within the existing OU2 GWETS to meet reinjection standards (discharge limits) for the COCs listed in Table 1, which are anticipated to be MCLs or detection limits using EPA Test Method 8260.

- A pipeline between the EW and the OU2 GWETS would need to be constructed to allow transfer of the extracted groundwater to the treatment plant. Treated effluent would be reinjected back into the aquifer through the reinjection wells associated with the existing OU2 GWETS.

- Implementation of this alternative, if it is selected, would be conducted as part of optimization of the existing OU2 GWETS during the remedial design phase. Costs associated with installing additional extraction wells, piping conveyance to tie these wells into the existing OU2 GWETS, and additional treatment capacity to treat groundwater extracted from this aquifer would be estimated during the remedial design associated with the optimization of the OU2 GWETS.

Lower 180-Foot Aquifer

This alternative presents a monitoring and contingency approach that includes a pumping scenario for this aquifer that assumes:

- The plume(s) would naturally attenuate over a period of approximately 30 years to meet RAOs.

- Chemical concentrations in groundwater and offsite plume migration would not increase in a statistically significant manner.

- A contingency plan would be developed for well-head treatment of groundwater (via activated carbon or air stripping) being extracted from potable water supply wells if COCs associated with OUCTP are detected in these wells.

- Costs associated with contingent wellhead treatment of water supply wells in the Lower 180-Foot Aquifer if COCs are detected in these wells would be estimated during the remedial design phase for implementation of the selected alternative.

The rationale for selection of the preferred remedial alternative is presented below.

2.12.3 Summary of the Estimated Remedy Costs

Capital costs associated with installing the lactate injection and recirculation treatment system and additional monitoring wells, and conducting the first lactate injection event, are estimated at approximately $4.99 million. Treatment system operations and maintenance costs for 15 years and 20 years of monitoring and reporting, plus subsequent demolition, are estimated at approximately $10 million, for a total estimated 20-year NPV cost of $15.04 million. A detailed, activity-based breakdown of the estimated costs associated with implementing and maintaining the remedy is provided in the OUCTP RI/FS (*MACTEC, 2006b*). The costs estimated in the OUCTP RI/FS have been revised from the original $9.54M to $15.04M in this document. This revision was made to account for inflation and additional components of the project that were excluded from the original costs, including monitored natural attenuation ($3.86M) and system demolition ($0.9M).

2.12.4 Expected Outcomes of Selected Remedy

The expected outcomes of Remedial Alternative 2 would be protection of human health and the environment through remediation of the A-Aquifer and Upper 180-Foot Aquifer plumes to at or below aquifer cleanup levels.

2.13 Statutory Determinations

The selected remedy satisfies the requirements of Section 121 of CERCLA:

- Protection of Human Health and the Environment: The selected remedy provides the greatest degree of protection for both human health and the environment within the shortest timeframe compared to the other alternatives, because it is the only alternative expected to cleanup concentrations of COCs in the A-Aquifer to at or below aquifer cleanup levels. Implementation of the selected remedy includes in situ remediation through the injection of sodium lactate or a similar solution into groundwater. This remedy would be effective in the short term because it would only take approximately six months to install the injection/recirculation wells and implement the first injection within the A-Aquifer.

- Compliance with Applicable or Relevant and Appropriate Requirements: The selected remedy is the only alternative evaluated that would comply with all ARARs. The categories of ARARs are action-specific, chemical specific, and location-specific. Action-, chemical-, and location-specific ARARs for the selected remedy are presented in Appendix A. While the Army does not consider California laws and regulations concerning land use covenants (LUCs) to be potential ARARs, after the OUCTP ROD is signed and at the time of property transfers, the Army will enter into state LUCs that document the land use restrictions selected as part of the remedy. Although the State of California and EPA Region IX disagree with the Army's determination that California laws and regulations concerning LUCs are not potential ARARs, they will agree - to - disagree on this issue if the Army signs LUCs acceptable to the DTSC. LUCs signed by the Army and the State of California in the past restricting the use of groundwater were acceptable to the DTSC.

- Cost Effectiveness: The selected remedy is a cost-effective solution for reducing risks to human health and the environment. The estimated net present value for the No Action alternative (Alternative 1) is approximately $3.86 million. The estimated cost of the selected remedy is approximately $15.04 million, which is commensurate with the higher level of protection of human health and the environment. The estimated cost of Alternative 2 is well below the estimates for Alternatives 3 and 4 ($18.93 million and $26.22 million, respectively).

- Utilization of Permanent Solutions and Alternative Treatment (or Recovery Technologies) Technologies to the Maximum Extent Practicable (MEP): The selected remedy will have the greatest long-term effectiveness and permanence because it will actively cleanup and contain the two upper groundwater plumes that are acting as a source of contamination to the Lower 180-Foot Aquifer. The selected remedy utilizes injections of a natural solution to actively reduce the toxicity, mobility, and volume of contaminants. This alternative would be effective in the short term because it would only take approximately six months to install the lactate injection/recirculation wells and implement the first injection within the A-Aquifer; install a new extraction well and connect it to the existing OU2 Groundwater Extraction and Treatment System in the Upper 180-Foot Aquifer; and install new monitoring wells and establish the Monitored Natural Attenuation program throughout OUCTP. It is the only remedy that would cleanup the entire A-Aquifer and Upper 180-Foot Aquifer plumes to at or below aquifer cleanup levels in less than 30 years.

- Preference for Treatment as a principal element.
- Five-Year Review Requirements: Because this remedy will result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within five years after initiation of remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

2.14 Documentation of Significant Changes from Preferred Alternative of Proposed Plan

As described in Section 2.4, the Proposed Plan for the OUCTP was released for public comment on June 5, 2006, and a public meeting was held on June 14, 2006. This Proposed Plan identified a preferred remedial alternative for OUCTP. Comments collected over the public review period between June 5 and August 4, 2006, did not necessitate any significant changes to the conclusions or procedures outlined in the OUTCP RI/FS and OUCTP Proposed Plan.

The remedial action cost reported for the preferred alternative in the Proposed Plan reflects costs developed in the Feasibility Study in 2004 of approximately $9.54 million. Since that time, additional information and adjustments for inflation have increased the costs to approximately $15.04 million. This revision was made to account for inflation ($0.74M) and additional components of the project that were excluded from the original costs, including monitored natural attenuation ($3.86M) and system demolition ($0.9M). These cost revisions do not affect the selection of the preferred alternative and do not impact the overall scope or performance of the selected remedial action.

3.0 RESPONSIVENESS SUMMARY

3.1 Overview

In the *Final Operable Unit Carbon Tetrachloride Plume Remedial Investigation/Feasibility Study (RI/FS), Former Fort Ord, California*, dated May 2006, and the Proposed Plan for the Operable Unit Carbon Tetrachloride Plume (OUCTP), the Army identified a preferred remedial alternative, which consisted of in situ enhanced biodegradation of the A-Aquifer, groundwater extraction and treatment of the Upper 180-Foot Aquifer using the existing Operable Unit 2 (OU2) groundwater extraction and treatment system (GWETS), and monitored natural attenuation (with wellhead treatment contingency) of the Lower 180-Foot Aquifer.

3.2 Summary of Comments Received During the Public Comment Period and Department of the Army Responses

Public comments submitted during the OUCTP Proposed Plan public comment period and the Army's responses are categorized and summarized in the sections below: A) Stakeholder Issues and Army Responses; and B) Technical and Legal Issues.

Approximately 15 comments were received, including comments from members of the public, the Fort Ord Environmental Justice Network (FOEJN), the University of California Santa Cruz (UCSC), and the California Regional Water Quality Control Board (RWQCB), Central Coast Region.

A. Stakeholder Issues and Army Responses

Comment A1. A general concern was raised that the 2-week notification to the public regarding the Proposed Plan public meeting was too short to adequately organize and inform the community and was not enough time to allow the FOEJN Technical Advisor to attend the meeting in-person. Additionally, FOEJN requested that the Army hold a second public meeting on the OUCTP Proposed Plan with 30-days advance notice.

Response A1: The U.S. Army is working with the Department of Toxic Substances Control (DTSC) and the U.S. Environmental Protection Agency (USEPA) to ensure that the public receive adequate notice for future public meetings. Because the FOEJN Technical Advisor was unable to attend in person accommodations were made to provide the technical advisor with a copy of the Army's OUCTP Proposed Plan Public Meeting presentation. In addition, the Army provided the Technical Advisor with telephone access to the public meeting. The request to hold a second public meeting concerning the OUCTP Proposed Plan was discussed among the Fort Ord Federal Facility Agreement (FFA) partners - U.S. Army, the DTSC, the California RWQCB, and the USEPA. The partners decided an additional public meeting was not warranted; however, a 30-day extension to the original comment period was granted in order to help allay public concerns. The comment period originally set to end on July 5, 2006 was extended through August 4, 2006.

Comment A2. A request that the presentation on the OUCTP Proposed Plan presented at the public meeting on June 14, 2006, also be presented to the Marina Planning Commission.

Response A2: On July 27, 2006, an Army representative made a presentation on the OUCTP Proposed Plan to the City of Marina Planning Commission.

Comment A3. A member of the public was concerned about how local development, which could include additional groundwater extraction, may influence the OUCTP and potential impacts this may have on the proposed remedial alternative.

Response A3: In order to prevent intentional or inadvertent access to contaminated groundwater or interference with ongoing and future groundwater remedial activities, a Monterey County Ordinance and deed restrictions are in place that restrict the installation of any water wells that could affect groundwater remediation (cleanup) systems. Should additional water supplies be needed in the future, water from the aquifers below those containing carbon tetrachloride (CT) (e.g., the 400-Foot Aquifer or 900-Foot Aquifer) will be used pending approval by the Fort Ord FFA partners in conjunction with sufficient monitoring to ensure that OUCTP remedial activities are not disrupted.

Comment A4. Concerns were expressed that the OUCTP Proposed Plan did not include enough information explaining the plan to remediate groundwater contamination; however, it was acknowledged that the document is not an RI/FS and the size and scope need to be manageable for public consumption.

Response A4: The Proposed Plan is intended to summarize the cleanup approach presented in detail in the OUCTP RI/FS. The OUCTP Proposed Plan was written in accordance with *A Guide To Preparing Superfund Proposed Plans, Records of Decision, And Other Remedy Selection Decision Documents, USEPA, July 1999*. Throughout the process, the OUCTP Proposed Plan was reviewed by the USEPA, DTSC and RWQCB. During this review, the Army and the regulatory agencies worked together to simplify and streamline the OUCTP Proposed Plan to maintain a broad public audience understanding of the document. Detailed descriptions of the cleanup alternatives evaluated, including the selected remedial alternative, were provided in Volume III of the Final OUCTP RI/FS, which is available on line at www.fortordcleanup.com. Information including decision documents, fact sheets, and notices of upcoming Fort Ord events are regularly posted on this web page.

Comment A5. Some members of the public expressed concern that not enough information regarding the decision making process, including the location of new construction associated with the alternatives, was provided. It was noted that these details would be of considerable interest to the community members.

Response A5: As described above, the Proposed Plan is intended to summarize the cleanup approach presented in detail in the OUCTP RI/FS. As specified in *A Guide To Preparing Superfund Proposed Plans, Records of Decision, And Other Remedy Selection Decision Documents* (*USEPA, 1999*), details regarding implementation of the alternatives (including time frames for implementation and construction details) will be provided in the remedial action work plan. The public is encouraged to visit www.fortordcleanup.com for the latest information (including recent documents and Groundwater Investigation and Cleanup Fact Sheets) on the OUCTP. The OUCTP remedial action work plan will be posted on the web site when available for public review.

Comment A6. A member of the public wanted to know how clean-up costs for OUCTP would be impacted if the federal maximum contaminant level (MCL) for carbon tetrachloride (CT) of 5.0 ppb were used instead of the State MCL cleanup level of 0.5 ppb.

Response A6: MCLs are enforceable standards for chemicals in drinking water that may affect public health. Within California, the State MCL for CT (0.5 ppb) takes precedence over the federal MCL for CT (5.0 ppb). The use of a higher cleanup level (federal MCL in this case) would typically result in lower cleanup costs; however, the federal MCL for CT could not be applied in evaluating the alternatives for OUCTP.

Comment A7. The University of California (UC) expressed several concerns with the Proposed Plan and implementation of the remedial alternative. The UC noted it had not been formally consulted on the Proposed Plan, even though implementation of the preferred alternative will be conducted partially on UC property (Fort Ord Natural Reserve [FONR]). The UC stated: (1) it needs to be assured its interests and obligations under the Installation-Wide Multi-Species Habitat Management Plan (HMP) and the Habitat Conservation Plan (HCP) will be protected during remediation; (2) it needs to understand what additional habitat obligations might be placed on them as a result of damages to the FONR as a result of the remedial action; and (3) that the U.S. Army or another entity will document and take full responsibility for any damages to roads, gates, other infrastructure or to any aspects of the ecological habitats of the FONR whether or not those elements are part of the HMP or the HCP.

Response A7: The Army intends to work closely with the UC FONR management to address these concerns as remedial activities are developed and implemented on the FONR. The Army will inform the UC/NRS Fort Ord Natural Reserve management prior to conducting any activities including planning and assessment activities on the property known as the FONR, and consult with appropriate FONR staff as to the manner of conducting required operations within the FONR, so as to avoid ecological damages and/or specific violations of the HMP and draft HCP conditions.

Comment A8. The California RWQCB, Central Coast Region expressed concern that one of their comments submitted on the Draft Proposed Plan was not addressed. The comment called attention to a significant community and Army success. The RWQCB stated that they objected to revising the Proposed Plan at this point in time, noting that it would cause inappropriate project costs and delays. The RWQCB took the opportunity to explain the significance of their original comment.

On page 5, Summary of Site Risks, paragraph one, the last two sentences in this paragraph describe how the Human Health Risk Assessment addresses *hypothetical* exposures to contaminated groundwater, and why these risks are purely hypothetical. We (California Regional Water Quality Control Board [RWQCB]) fully agree with the content of this text. No exposure routes to groundwater have been identified, access to contaminated groundwater is prohibited, and therefore the exposure risks are hypothetical. Unfortunately, there is no analogous page five text to describe the limited exposure threat to volatile organic compounds (VOCs) in the plume's Preston park source are. Although the Site Characteristics section on page three contains descriptions of successful soil vapor extraction source removal at the Lexington Court area in Preston Park, there is nothing in the page five cancer risk discussion to indicate reduced health risks for source area residents. Without making this link, source area readers may reasonably but incorrectly infer that they are currently exposed to an unmitigated risk from VOCs.

In addition, as the Army has drawn recent criticism regarding the effectiveness of its Community Involvement Workshops (CIWs), and been called to reestablish the former Restoration Advisory Board, we wish to point out that the Army's soil vapor extraction system was modified at considerable effort and expense as a result of community input from the January 13, 2006 CIW. It was at this meeting that a local family with an infant, which had waited on a list to move to their Preston Park residence, was seriously considering moving to more expensive housing because of the perceived threat of VOCs to their child. This concern resulted in expanding soil vapor extraction system plans to include the family's residence, although no legal or scientific requirement existed.

As our staff has watched the Army spend considerable effort and resources to successfully mitigate soil gas contaminants in the Preston Park source area, we believe it appropriate that these residents be reminded that this threat has been removed, and that the Army receives credit for responding to community concerns received in their CIWs.

Response A8: The Army appreciates input to the process from the RWQCB.

B. Technical and Legal Issues

Comment B1. Questions were raised regarding a lack of an evaluation (in both the RI/FS and the OUCTP Proposed Plan) of an alternative to natural attenuation for the Lower 180-Foot Aquifer. It was suggested that an evaluation of lactate injection be included as a remedial alternative. It was also suggested that monitoring wells used to investigate the Lower 180-Foot Aquifer could be used to deliver the lactate.

Further concerns were raised regarding natural attenuation in the Lower 180-Foot Aquifer because: (1) the Lower 180-Foot aquifer is in the closest proximity to the drinking water supply wells and is the aquifer that is commingled with the OU2 trichloroethene (TCE) plume and may already be mixing with water used for drinking water supplies; (2) the water in the Lower 180-Foot Aquifer is already receiving water from the upper aquifers through two conduits and these aquifers are also contaminated with carbon tetrachloride; and (3) the CT plume is moving eastward toward the drinking water supply wells.

Response B1: Active remedial solutions were considered and discussed with the FFA partners on May 17, 2005, where it was agreed that an engineered solution for cleanup within the Lower 180-Foot Aquifer was not practical due to: (1) the relatively low concentrations of CT (typically less than 5.0 ppb; State MCL is 0.5 ppb), (2) the significant depth (over 300 feet below ground surface), and (3) the high permeability of this aquifer. Rather, it was recognized that it would be more effective to eliminate conduits allowing CT to enter the Lower 180-Foot Aquifer and allow CT already present within the Lower 180-Foot Aquifer to naturally attenuate. Additionally, the preferred alternative includes active treatment (wellhead treatment contingency) should CT be detected in water supply wells on the former Fort Ord.

Army constructed man-made conduits (groundwater monitoring wells) connecting the A-Aquifer with the Upper 180-Foot and Lower 180-Foot Aquifers were previously destroyed. Thus, there is no longer a pathway for chemicals in the uppermost A-Aquifer plume to migrate into the Upper 180-Foot Aquifer and then into the Lower 180-Foot Aquifer. Therefore, CT concentrations in the Upper 180-Foot and Lower 180-Foot Aquifers are expected to decrease over time. The Upper 180-Foot Aquifer (approximately 60 feet in thickness) is separated from the Lower 180-Foot Aquifer, (approximately 200 feet in thickness) by the Intermediate 180-Foot Aquitard (approximately 50 feet in thickness). This hydraulically isolates the Upper and Lower 180-Foot Aquifers from one another. The Intermediate 180-Foot Aquitard eventually thins and ultimately is not present in the southern portion of the OUCTP study area. Where this aquitard is not present, a natural conduit is created and groundwater from the Upper 180-Foot Aquifer drains into the Lower 180-Foot Aquifer. This natural conduit connecting the Upper and Lower 180-Foot Aquifers is currently being addressed with additional extraction wells as part of the OU2 Groundwater Extraction and Treatment System (OU2 GWETS).

The potential for injecting lactate or initiating other in situ (in place, underground) enhanced biodegradation technologies within the Lower 180-Foot Aquifer was eliminated from further consideration because of the large area (aerial extent) of the plume and the complex hydrogeology of the aquifer (which is used as a source of drinking water by the City of Marina). Injection of a carbon source such as lactate is problematic at depths such as the Lower 180-Foot Aquifer, primarily due to the extensive infrastructure necessary to monitor the effects of this approach. Use of monitoring wells is not viable as no objective monitoring network would then exist. Over an extended period of time (approximately 30 years), natural attenuation of contamination through transport, biological degradation, and dispersion are anticipated to eventually reduce concentrations of contaminants in groundwater. It is

important to note that CT has not been detected in the active drinking water supply wells serving the Fort Ord community.

Comment B2. Concerns were expressed regarding the relationship between increasing levels of vinyl chloride and decreasing levels of CT in groundwater. It was noted this trend supports concerns raised about CT breaking down into other chemicals; therefore, monitoring of soil gas for CT breakdown products (including vinyl chloride) should continue because the source of CT has not been properly identified and soil gas concentrations could increase without an active SVE system.

Response B2: Vinyl chloride is a breakdown product of chlorinated ethenes like tetrachloroethene, trichloroethene, and dichloroethene. Vinyl chloride is not a breakdown product of CT and there is no identified chemical relationship between the two compounds. The Army will, however, monitor for chloroform and dichloromethane, which are breakdown compounds of CT, as chemicals of concern in groundwater because there is the potential that they may be produced in the A-Aquifer during in situ (in place, underground) enhanced bioremediation (lactate injection). Ethene breakdown compounds vinyl chloride 1,1-dichloroethylene, and 1,2-dichloroethylene (1,2-DCE) will also be monitored as chemicals of concern in groundwater.

Permanent soil gas sampling probes remain onsite for future sampling if deemed necessary by the Army and the regulatory agencies. The source area of CT was identified through historical documentation and interviews, and well defined by numerous soil gas probes at various depths between the surface and the water table. A pilot soil vapor extraction and treatment system was installed to remediate vadose zone soils in the OUCTP source area. Previous investigations showed that the soil gas concentrations were higher in proximity to the water table than at shallow depths. Phase I of the soil vapor extraction system was operated for 8 weeks. Three sets of samples were collected on a monthly frequency after Phase I shut down. These samples showed a slight increase in concentration (10 parts per billion); therefore the soil vapor extraction system was operated for an additional 8 weeks (Phase II). VOC concentrations continued to decrease and CT concentrations were reduced to low levels (approximately 2 parts per billion). The CT soil gas data collected 6 months after the soil vapor extraction system was shut down showed only minor variations (an average of 0.06 parts per billion by volume) in CT concentration. The soil vapor data showed no significant evidence of a return to levels observed before the operation of the soil vapor extraction system. The soil vapor extraction program included a significant shut-down period (during which chemical concentrations in soil gas did not rebound) and a second period of operation. There is no evidence to suggest chemical concentrations in soil gas could increase; therefore, soil vapor extraction was not warranted.

Comment B3. A request was made for further information as to the effects of CT on humans. Specifically, is there a particular population that is at greater risk such as children or women who are pregnant?

Response B3: According to the Agency for Toxic Substances and Disease Registry (ATSDR), there are many adverse effects of exposures to high concentrations of CT, as described below. Within the OUCTP, however, the concentrations of carbon tetrachloride are relatively low (less than 20 parts per billion; State MCL is 0.5 ppb) and contaminated groundwater within OUCTP is not extracted/used by any water supply system. Because the drinking water supply has not been impacted by the OUCTP, and because CT levels detected in soil gas are very low (near the detection limit), no impacts to human health from exposure to CT in soil gas or groundwater are expected.

High exposure to CT can cause liver, kidney, and central nervous system damage. These effects can occur after ingestion or breathing CT, and possibly from exposure to the skin. The liver is especially sensitive to CT (the liver enlarges and cells are easily damaged or destroyed). Kidneys also are damaged

by CT, resulting in a build up of wastes in the blood. If exposure is low and brief, the liver and kidneys can repair the damaged cells and function normally again. Effects of CT are more severe in persons who drink large amounts of alcohol.

If exposure is very high, the nervous system, including the brain, is affected. People may feel intoxicated and experience headaches, dizziness, sleepiness, and nausea and vomiting. These effects may subside if exposure is stopped, but in severe cases, coma and even death may occur.

There have been no studies of the effects of CT on reproduction in humans, but studies in rats showed that long-term inhalation may cause decreased fertility.

Studies in humans have not been able to determine whether CT can cause cancer due to there usually being exposure to other chemicals at the same time. Swallowing or breathing CT for years caused liver tumors in animals. Mice that breathed CT also developed tumors of the adrenal gland. The Department of Health and Human Services (DHHS) has determined CT may reasonably be anticipated to be a carcinogen. The International Agency for Research on Cancer (IARC) has determined CT is possibly carcinogenic to humans, whereas the EPA determined CT is a probable human carcinogen.

The health effects of CT have not been studied in children, but they are likely to be similar to those seen in adults exposed to the chemical. It is not known whether children differ from adults in their susceptibility to CT.

A few survey-type studies suggest that maternal drinking water exposure to CT might possibly be related to certain birth defects. Studies in animals showed that CT can cause early fetal deaths, but did not cause birth defects. A study with human breast milk in a test tube suggested that it would be possible for CT to pass from the maternal circulatory system to breast milk, but there is no direct demonstration of this occurring.

As stated previously, because the drinking water supply has not been impacted by the OUCTP, and because CT levels detected in soil gas are very low (near the detection limit); no impacts to human health from exposure to CT in soil gas or groundwater are expected.

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TABLES

Table 1. Chemicals of Concern and Aquifer Cleanup Levels
Record of Decision, Operable Unit Carbon Tetrachloride Plume
Former Fort Ord, California

Chemicals of Concern	Maximum Contaminant Levels (MCLs)		Aquifer Cleanup Levels [c]	State or Federal MCL Selected as the ACL	Maximum Chemical Concentration Detected		Aquifer Discharge Levels [f]
	State [a] µg/L	Federal [b] µg/L	µg/L		Historical [d] µg/L	2004 [e] µg/L	
A-Aquifer							
CT	0.5	5	0.5	State	19	15	0.5
PCE	5	5	5	State	1.63	0.87	0.5
TCE	5	5	5	State	6.4	4.9	0.5
DCE	6	7	6	State	0.44	0.44	0.5
Chloroform	--	--	2 [g]	Other	1.8	1.6	0.5
1,2-DCE	6	70	6	State	0.44	0.44	0.5
Dichloromethane	5	5	5	State	17	ND	0.5
Vinyl Chloride	0.5	2	0.1 [g]	Other	ND	ND	0.1
Upper 180-Foot Aquifer							
CT	0.5	5	0.5	State	9.8	3.5	0.5
Lower 180-Foot Aquifer							
1,2-DCA	0.5	5	0.5	State	1.7	1.2	0.5
CT	0.5	5	0.5	State	6.95	3.6	0.5

Abbreviations:

ACL = aquifer cleanup level
µg/L = Micrograms per liter
DLRs = Detection limits for purposes of reporting
MCL = maximum contaminant level
PHGs = Public health goals
1,2-DCA = 1,2-dichloroethane
PCE = Tetrachloroethene
CT = carbon tetrachloride
TCE = trichloroethene
DCE = 1,1-dichloroethylene
1,2-DCE = 1,2-dichloroethylene
ND = Not Detected

Footnotes:

[a] California Department of Health Services (DHS). November 10, 2004. *MCLs, DLRs and PHGs for Regulated Drinking Water Contaminants.* www.dhs.ca.gov/ps/ddwem/chemicals/phgs/chemicalinformation.htm.

[b] U.S. Environmental Protection Agency (EPA). August 2006. *2006 Edition of the Drinking Water Standards and Health Advisories.* EPA 822-R-06-013.

[c] The aquifer cleanup levels for OUCTP are based on applicable water quality objectives and are the more stringent value of the Federal and State MCLs. If the MCLs are revised in the future, the ACLs will be revised accordingly.

[d] The maximum chemical concentration detected for each COPC shown are from groundwater monitoring data collected between January 1, 1992 to September 30, 2004.

[e] The maximum chemical concentration detected for each COPC shown are from groundwater monitoring data collected between August 15, 2004 to September 30, 2004.

[f] Harding Lawson Associates (HLA). February 23, 2001. *Annual Evaluation Report, Revision B, October 1999 through September 2000, OU1 and OU2 Groundwater Remedies, Former Fort Ord, California.*

[g] Aquifer cleanup level was derived from a risk-based calculation in the *Final Feasibility Study Report* (*Dames and Moore, 1993*).

Table 2. Transfer Status of Parcels Overlying the OUCTP Record of Decision, Operable Unit Carbon Tetrachloride Plume Former Fort Ord, California

Parcels Affected by OUCTP	Transferred	Transfer Document	Land Use Covenant	Recipient	Anticipated Recipient
E4.3.2.2	NO	FOSET 5/ESCA	YES	--	FORA
E4.4	YES	FOST, Preston/Stilwell Park	NO	FORA	--
E4.6.1	YES	FOST 9	YES		
E4.6.2	YES	FOST 9	YES		
E4.7.1	NO	FOSET 5/ESCA	YES	--	FORA
E4.7.2	NO	FOSET 5/ESCA	YES	--	FORA
E5a.1	NO	FOSET 5/ESCA	YES	--	FORA
E5a.2	YES	FOST 8	YES	FORA	--
L1.2	YES	FOST, Monterey College of Law	NO	Monterey College of Law	--
L5.10.1	NO	FOSET 5/ESCA	YES	--	FORA
L7.2	YES	FOST, MPUSD, Phase II	NO	MPUSD	--
L12.1	YES	FOST, Peninsula Outreach Bldgs. 6279, 6280	NO	Shelter Outreach Plus	--
L17.2	YES	FOST, Shelter Plus	NO	Shelter Outreach Plus	--
S1.2.1	YES	FOST, CSUMB Phase I	NO	CSUMB	
S2.1.1	YES	FOST, UCSC Phase I	NO	UCSC	--
S2.1.2	NO	Not Determined	YES	--	UCSC
S2.1.1.1	YES	FOST, UCSC Phase I	NO	UCSC	--
S2.1.1.2	YES	FOST, UCSC Phase I	NO	UCSC	--
S2.1.3	YES	FOST, UCSC Phase I	NO	UCSC	--
S2.1.5	YES	FOST, UCSC Phase I	NO	UCSC	--
S2.1.5.1	YES	FOST, UCSC Phase I	NO	UCSC	--
S2.3.1.1	YES	FOST, UCSC Phase I	NO	UCSC	--
S2.3.2.1	YES	FOST, UCSC Phase I	NO	UCSC	--
S2.3.2.2	YES	FOST, UCSC Phase I	NO	UCSC	--
S2.4	YES	FOST, UCSC Phase I	NO	UCSC	--

FOSET = Finding of Suitability for Early Transfer
ESCA = Environmental Services Cooperative Agreement
FORA = Fort Ord Reuse Authority
MPUSD = Monterey Peninsula Unified School District
FOST = Finding of Suitability to Transfer
CSUMB = California State University Monterey Bay
UCSC = University of California Santa Cruz

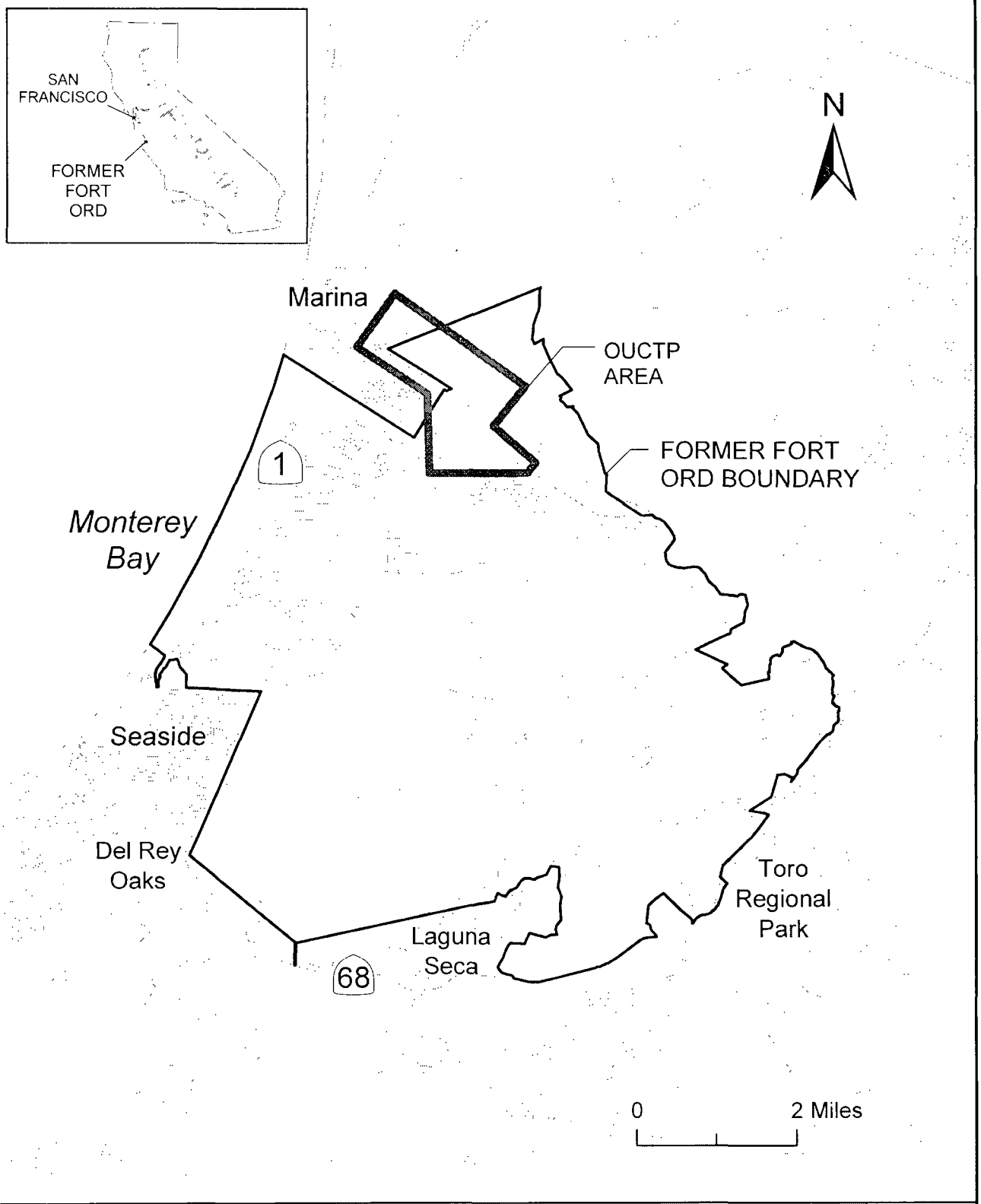
Table 3. The Remedy's Compliance with CERCLA Guidance
Record of Decision, Operable Unit Carbon Tetrachloride Plume
Former Fort Ord, California

EPA CERCLA Evaluation Criteria	**The Remedy:** In Situ Enhanced Biodegradation (A-Aquifer); Groundwater Extraction and Treatment Within OU2 Groundwater Treatment System (GWETS; Upper 180-Foot Aquifer); Monitored Natural Attenuation (MNA) with Wellhead Treatment Contingency (Lower 180-Foot Aquifer).
Overall Protection of Human Health and the Environment	Would provide the greatest protection because it is expected to reduce groundwater chemicals of concern (COCs) throughout the entire A-Aquifer plume to below aquifer cleanup levels within 15 years and the Upper 180-Foot Aquifer in a similar timeframe. Long-term monitoring would also be conducted with wellhead treatment contingency.
Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)	Would comply with chemical-specific and action-specific ARARs within the A-Aquifer and Upper 180-Foot Aquifer because aquifer cleanup levels could be achieved within 15 years. In the shorter term, however, a containment zone may need to be established to comply with such ARARs in the Lower 180-Foot Aquifer, which would rely on MNA.
Short-Term Effectiveness	Would be effective in the short term at achieving remedial action objectives (RAOs), and would be effective in the short term regarding its implementability. It would take approximately six months to install the lactate injection/ recirculation wells and implement the first injection within the A-Aquifer, and install an extraction well and tie-in to the OU2 GWETS within the Upper 180-Foot Aquifer. There would be potential risks to workers or the community; however, these procedures are frequently conducted according to approved standard operating procedures (SOPs).
Long-Term Effectiveness	Would have significant long-term effectiveness and permanence because it would actively remediate and contain the A-Aquifer and Upper 180-Foot Aquifer plumes. This alternative employs reliable risk controls throughout these plumes and wellhead treatment of water supply wells in the Lower 180-Foot Aquifer if COCs are detected in these wells.

Reduction of Toxicity (T), Mobility (M), or Volume (V) Through Treatment	Would actively reduce T, M, V of COCs and achieve reduction to below aquifer cleanup levels throughout the entire plume via in situ enhanced biodegradation treatment in the A-Aquifer, Groundwater Extraction and Treatment in the Upper 180-Foot Aquifer, and natural attenuation processes throughout OUCTP and specifically in the Lower 180-Foot Aquifer, with additional reduction in this aquifer if COCs are detected in water supply wells and wellhead treatment is implemented.
Implementability	Would require a moderate level of effort to implement from a technical perspective because it involves installation of several hundred injection points/recirculation wells and equipment, extraction wells, piping, and monitoring wells, as well as long-term treatment system operations and maintenance, and long-term MNA and reporting over a period of 30 years; however, the required equipment, skilled labor resources, permits and approvals would be readily available. Would be moderately easy to implement from an administrative perspective (gaining regulatory approval/ community acceptance) because it would provide the most protection and comply with ARARs through active remediation of the A-Aquifer and Upper 180-Foot Aquifer plumes using proven technologies, and would also include long-term MNA over a period of 30 years to assess the status of the all three aquifer plumes, as well as a contingency for wellhead treatment in the Lower 180-Foot Aquifer if COCs are detected in water supply wells.
Regulatory Agency and Community Acceptance	Likely to be acceptable because it would protect human health and the environment; would comply with ARARs; and takes action both in the short and long term to achieve aquifer cleanup levels in both the A-Aquifer and Upper 180-Foot Aquifers, while including contingent wellhead treatment of water supply wells in the Lower 180-Foot Aquifer if COCs are detected in these wells.
Total 30-Year NPV Cost (millions)	$15.04

NPV = Net present value costs

PLATES



OUCTP Area and Fort Ord Location Map
Record of Decision, OUCTP
Former Fort Ord
Monterey County, California

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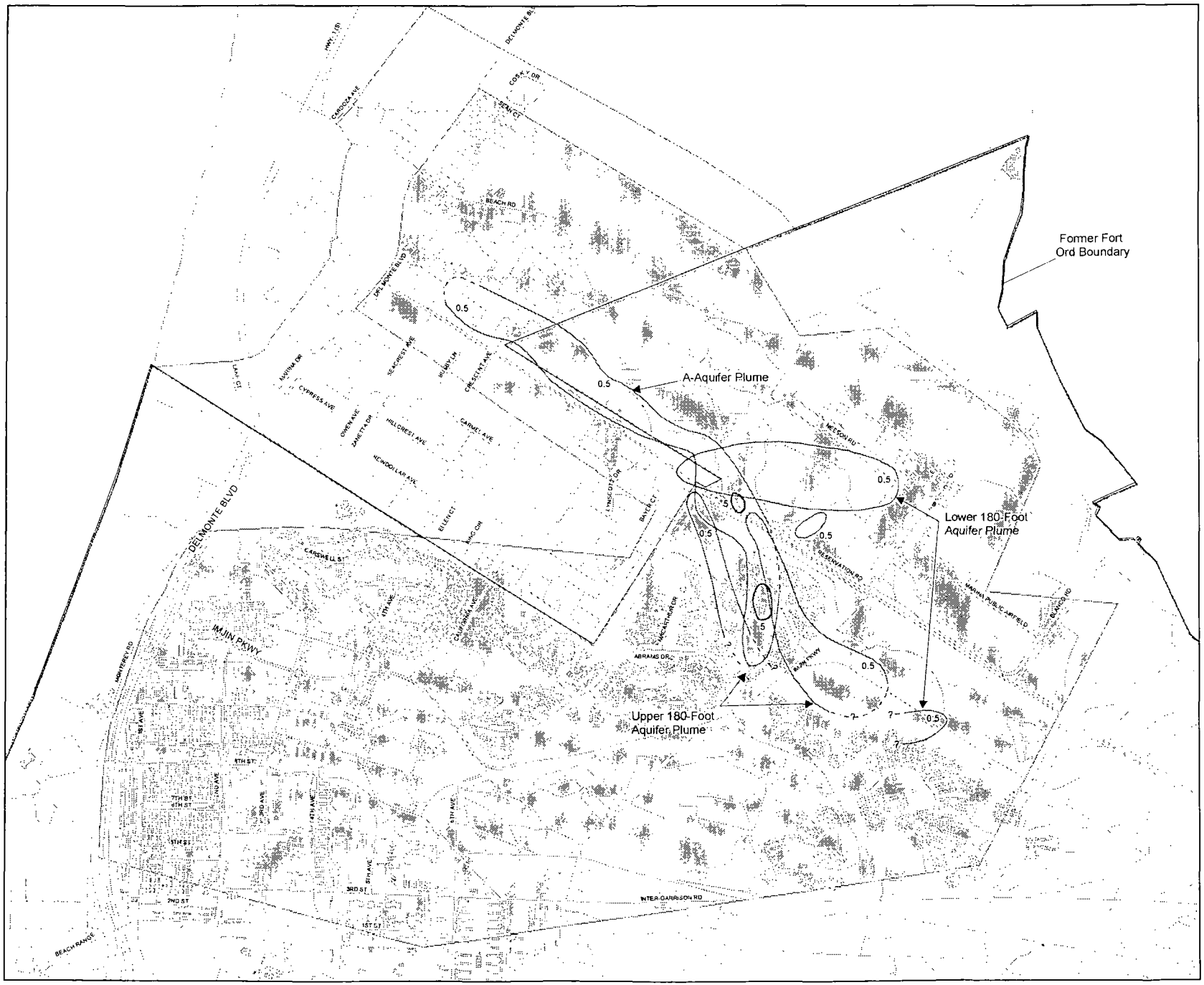

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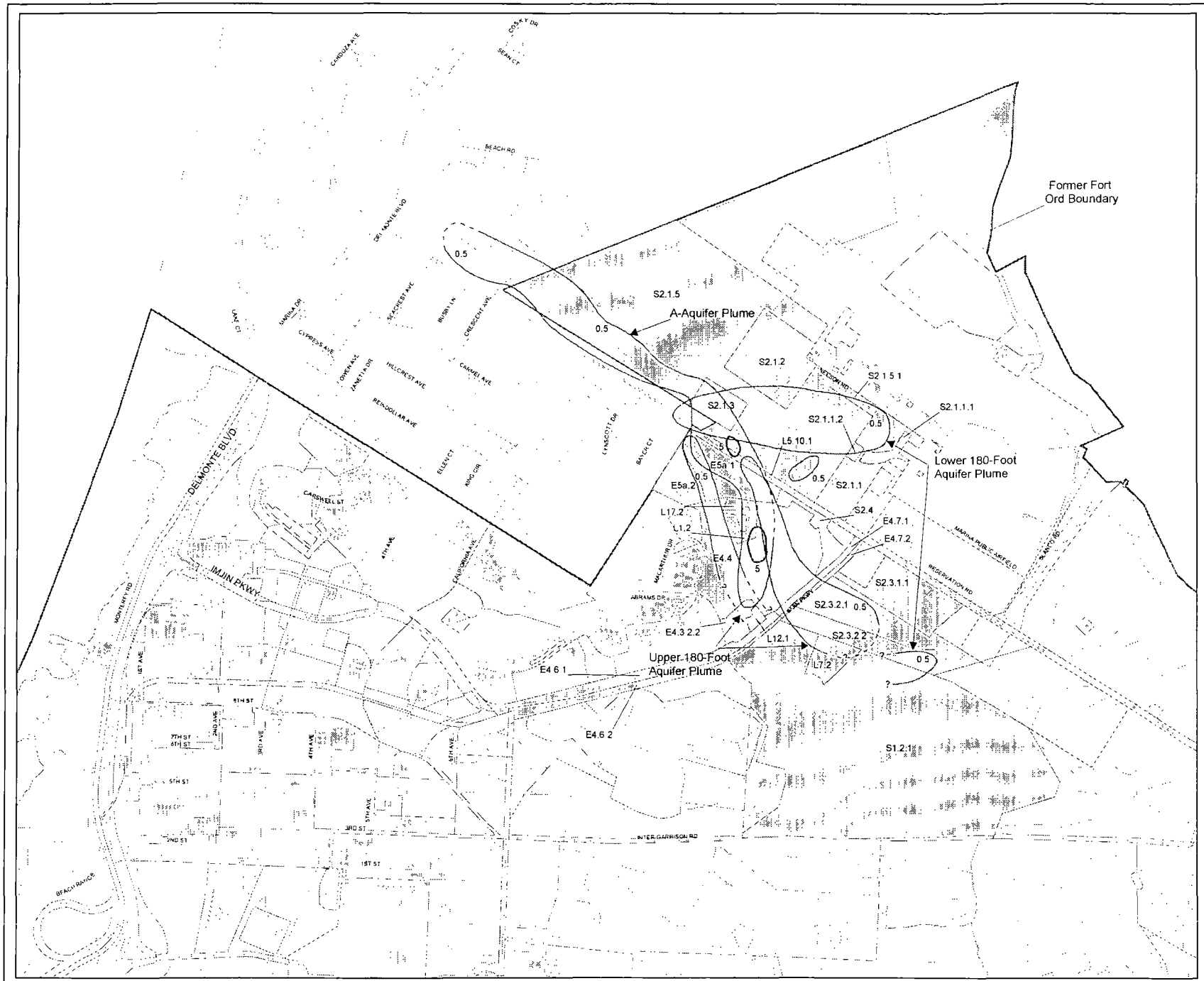

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Record of Decision, OUCTP
Former Fort Ord
Monterey County, California

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APPENDIX A

APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS FOR THE SELECTED REMEDY

APPENDIX A
APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS) FOR THE SELECTED REMEDY

Source or Authority	Requirement, Standard, or Criterion	Applicable or Relevant and Appropriate	Description	Remarks
Chemical-Specific Requirements				
State Water Quality Control Plan, Central Coast Regional Water Quality Control Board (RWQCB)	Resolution No. 89-04; Portions of Central Coast Region Basin Water Quality Control Plan	Applicable	Establishes criteria for groundwater to be considered a drinking water source and contains requirements for implementation plans or action plans for attaining compliance with these standards. The Plans establish water quality standards (including beneficial use designations, water quality objectives to protect these uses, and implementation programs to meet the objectives) that apply statewide or to specific water basins.	Groundwater at OUCTP is considered a potential drinking water, industrial water, and agricultural water source under the Basin Plan; applicable State Water Resources Control Board Resolutions are described under Action-Specific Requirements. Through these resolutions, the consideration of maximum benefit is limited to the range between Maximum Contaminant Levels (MCLs) and 'non-detectable' for most groundwater basins in the State. The groundwater cleanup standards for OUCTP are based on applicable water quality objectives and are the more stringent of federal and State MCLs. The goal of the remedial actions evaluated herein is to restore the uses of groundwater within and adjacent to OUCTP. Results from other sites suggest full restoration of beneficial uses of groundwater may not be possible, even with active remediation at OUCTP. If full restoration of beneficial uses is neither technologically nor economically achievable within a reasonable period of time, then the Army may request modification to the cleanup standards or establishment of a containment zone, a limited groundwater pollution zone where water quality objectives are exceeded. Conversely, if new technical information indicates cleanup standards can be surpassed, the Board, in consultation with the BCT, may decide if further cleanup actions should be taken.

Source or Authority	Requirement, Standard, or Criterion	Applicable or Relevant and Appropriate	Description	Remarks
National Primary Drinking Water Standards (promulgated under the Safe Drinking Water Act and amendments to the Act)	40 Code of Federal Regulations (CFR) Part 141, §300.430 [e][2][i][B]/[C].	Relevant and Appropriate	Establishes MCLs permissible for a public water system; the highest levels of contaminants allowed in drinking water, and are enforceable standards. MCL Goals (MCLGs) are (1) levels of contaminants in drinking water below which there is no known or expected risk to health, (2) allow for a margin of safety, and (3) are non-enforceable public health goals.	MCLs are set as close to MCLGs as feasible using the best available treatment technology and taking cost into consideration. Those federal MCLs more stringent than State MCLs are used as Aquifer cleanup levels for OUCTP.
State Primary and Secondary Drinking Water Standards	California Safe Drinking Water Act of 1976 (Health and Safety Code [H&SC] §§ 4010.1 and 4026(c)); California Code of Regulations (CCR) Title 22, Chapter 15	Relevant and Appropriate	Establishes enforceable limits for chemicals that may affect public health or the aesthetic qualities of drinking water.	State MCLs more stringent than federal MCLs are used as Aquifer cleanup levels at OUCTP. For chemicals where there is no federal MCL, the State MCLs, if they exist, are used as Aquifer cleanup levels at OUCTP.
Identification and Listing of Hazardous Waste	Title 22 CCR, Division 4.5, Chapter 11	Relevant and Appropriate	Establishes/defines procedures and criteria for identification and listing of Resource Conservation Recovery Act (RCRA) and non-RCRA hazardous wastes. Chemicals regulated as hazardous waste, and the levels at which they are hazardous, are identified in these regulations.	If any drill cuttings, decontamination water, or groundwater treatment residues subsequently characterized as hazardous are generated, any such wastes will be managed according to the substantive requirements of these regulations.

Source or Authority	Requirement, Standard, or Criterion	Applicable or Relevant and Appropriate	Description	Remarks
National Primary and Secondary Ambient Air Quality Standards (NAAQS)	40 CFR 150, federal Clean Air Act, §109, 42 USCA 7401-7642	Relevant and Appropriate; Also an Action-Specific Requirement	Establishes enforceable limits for chemicals that may affect air quality. For the region of California in which the former Fort Ord is located, the Monterey Bay Unified Air Pollution Control District (MBUAPCD) requirements are applicable instead because they incorporate NAAQSs and in some cases more stringent requirements specific to the Monterey Bay Area.	If groundwater from OUCTP is extracted for aboveground treatment and the contaminant treatment system is vented to the atmosphere (e.g., using an air stripper), depending on the concentrations of contaminants present, the offgas effluent will be managed (e.g., further treated using vapor phase activated carbon adsorption polishing) to remove concentrations of any contaminants above MBUAPCD standards.
Monterey Bay Unified Air Pollution Control District (MBUAPCD)	Regulation II (New Sources) and Regulation X, Rule 207 (Toxic Air Contaminants)	Relevant and Appropriate; Also an Action-Specific Requirement	Regulates new sources and toxic air contaminants, and restricts specific discharges of organic compounds to the atmosphere through remedial actions (e.g., removal of organic compounds from groundwater using air stripping). MBUAPCD requirements may limit emissions of total and individual organic compounds on a site-specific basis and/or may require emission controls using the Best Available Control Technology (BACT). MBUAPCD regulates releases of certain identified or potential air toxics at levels determined to be "appropriate for review." In some cases, a risk assessment may be required.	If groundwater from OUCTP is extracted for aboveground treatment and the contaminant treatment system is vented to the atmosphere (e.g., using an air stripper), depending on the concentrations of contaminants present, the offgas effluent will be managed (e.g., further treated using vapor phase activated carbon adsorption polishing) in compliance with the substantive requirements of these regulations to remove concentrations of any contaminants above MBUAPCD standards.

Source or Authority	Requirement, Standard, or Criterion	Applicable or Relevant and Appropriate	Description	Remarks
Location-Specific Requirements				
Endangered Species Act (ESA)	16 United States Code (U.S.C.) §1531 et seq.	Relevant and Appropriate	Federal agencies are required under the ESA to ensure their actions do not jeopardize the continued existence of a listed species or result in destruction of or adverse modification of its critical habitat. If the proposed action may affect the listed species or its critical habitat, consultation with the US Fish and Wildlife Service (USFWS) and/or California Department of Fish and Game may be required. Additionally, the ESA prohibits the illegal taking of a listed species.	The Army has completed an endangered species, Section 7 consultation, and the USFWS has issued a Biological Opinion for Army disposal and reuse actions at Fort Ord. Endangered plant and animal species and critical habitats are present at Fort Ord. Each reuse area will be screened for potential impacts to any endangered species identified in the April 1997 Installation-Wide Multispecies Habitat Management Plan for Former Fort Ord, California (HMP). The provisions of the HMP satisfy the requirements of the ESA. OUCTP contains areas that have specific resources of concern. Potential locations for OUCTP groundwater extraction and/or treatment systems will be screened for potential environmental impacts to any endangered species identified in the HMP. The HMP report recommends measures, as necessary, to ensure compliance with the ESA for any remedial actions implemented at the former Fort Ord.
California Endangered Species Act	Fish and Game Code §2050 et seq.	Relevant and Appropriate	Provides for the recognition and protection of rare, threatened and endangered species of plant and animals (in conjunction with State authorized or funded actions).	OUCTP contains areas that have specific resources of concern. Potential locations for OUCTP groundwater extraction and/or treatment systems will be screened for potential environmental impacts to any endangered species identified in the HMP, which recommends measures, as necessary, to ensure compliance with this Act for any remedial actions implemented at the former Fort Ord.
Migratory Bird Treaty Act	16 U.S.C. §§703-712	Relevant and Appropriate	The statute sections prohibit the taking, possession of, buying, selling, purchasing, or bartering of any migratory bird, including feathers or other parts, nest eggs, or products, except as allowed by regulations.	Migratory birds may be present within the OUCTP area. Potential locations for OUCTP groundwater extraction and/or treatment systems will be screened for potential environmental impacts to migratory birds to ensure compliance with this Act for any remedial actions implemented.

Source or Authority	Requirement, Standard, or Criterion	Applicable or Relevant and Appropriate	Description	Remarks
Standards for the Management of Wastes Discharged to Land	Title 23 CCR, Division 3, Chapter 15, Article 2 (Waste Classification and Management), §2511(d), Title 27 CCR, Division 2, §20090(d)	Relevant and Appropriate	Establishes standards for the management of waste discharged to land and provides exemptions to these requirements for cleanups taken at the direction of public agencies, as long as requirements of Article 2 are met for waste that is removed from the point of release under any remedial alternatives and disposed untreated.	Any drill cuttings, decontamination water, or groundwater treatment residues will be managed according to the substantive requirements of these regulations.
Other Requirements Considered During the Evaluation of Location-Specific ARARs				
Fish and Wildlife Coordination Act	16 U.S.C. §661 et seq.		Requires fish and wildlife to be protected if remedial actions modify the drainage channel or other features of surface waters such as streams and rivers.	No foreseeable remedial action at OUCTP would modify a drainage channel or other surface water feature. However, potential locations for OUCTP groundwater extraction and/or treatment systems will be screened for potential environmental impacts to fish or wildlife to ensure compliance with this Act for any remedial actions implemented.
Coastal Zone Management Act and California Coastal Act of 1976	16 U.S.C. §1456 et seq./ Public Resources Code §3000 et seq.		Requires activities conducted within the coastal zone to be conducted in a manner consistent with the State-approved management program.	Former Fort Ord is located in a coastal area, but groundwater within OUCTP is not directly adjacent to the coast; therefore, these standards do not apply to remedial activities within OUCTP.
Waste Management Unit Classification and Siting	40 CFR 264.18a,b		New hazardous waste treatment, storage, or disposal (TSD) units are prohibited from being located within 200 feet of a geologic fault displaced in Holocene time, and should not be located within a 100-year floodplain unless it is designed to prevent washout of any waste by a 100-year flood.	OUCTP is located within a seismically active region, but not near such a fault, and not within a known floodplain. Therefore, these prohibitions do not apply to the potential locations of groundwater extraction and/or treatment systems that may contain concentrations of chemicals considered as hazardous waste.

Source or Authority	Requirement, Standard, or Criterion	Applicable or Relevant and Appropriate	Description	Remarks
Action-Specific Requirements				
Porter-Cologne Water Quality Control Act	Chapter 1 §13000, et seq., Division 7, of the California Water Code; California State Water Resources Control Board (SWRCB) Resolution Numbers 88-63, 68-16, and 92-49	Applicable	Resolution No. 88-63: "Sources of Drinking Water" specifies all ground and surface water is an existing or potential source of drinking water unless: (1) total dissolved solids (TDS) are greater than 3,000 parts per million (ppm or milligrams per liter [mg/L]), (2) the well yield is less than 200 gallons per day (gpd) from a single well, or (3) the groundwater is unreasonable to treat using best management practices or best economically achievable treatment practices.	Groundwater in all three aquifers of concern in OUCTP (A-Aquifer; Upper 180-Foot Aquifer; Lower 180-Foot Aquifer) meet the first two criteria (i.e., TDS levels are below 3,000 ppm; well yield is above 200 gpd). It is assumed to potentially meet the third criteria (i.e., it is reasonable to treat using best management practices or best economically achievable treatment practices). The goal of the remedial actions evaluated herein is to restore the uses of groundwater within and adjacent to OUCTP. Results from other sites suggest full restoration of beneficial uses of groundwater may not be possible, even with active remediation at OUCTP. If full restoration of beneficial uses is neither technologically nor economically achievable within a reasonable period of time, then the Army may request modification to the cleanup standards or establishment of a containment zone, a limited groundwater pollution zone where water quality objectives are exceeded. Conversely, if new technical information indicates cleanup standards can be surpassed, the Board may decide if further cleanup actions should be taken.
			Resolution No. 68-16: "Statement of Policy with Respect to Maintaining High Quality of Waters in California" requires attainment of background levels of water quality, or the highest level of water quality which is reasonable if background levels of water quality cannot be restored. Cleanup levels other than background must be consistent with the maximum benefit to the people of the State, not unreasonably affect present and anticipated uses of such	The Army believes that Resolution 92-49, including III.G, is not an ARAR. The Army will comply with the substantive requirements of Resolution 92-49 to the extent described above. The EPA believes that Section III.G of Resolution 92-49 is relevant and appropriate because it includes substantive requirements for the remediation of contaminated groundwater, but that the balance of the Resolution is procedural in nature and therefore not an ARAR. The State disagrees with the Army and USEPA's characterization of Resolution 92-49 and asserts that 92-49 Section III is an "applicable" requirement for the remedy because it contains substantive requirements that have been promulgated and are of general applicability. Because the Army has selected a remedy that is consistent with the substantive requirements of Resolution 92-49, the State does not intend to dispute the Record of Decision.

Source or Authority	Requirement, Standard, or Criterion	Applicable or Relevant and Appropriate	Description	Remarks
			water, and not result in exceedance of applicable water quality objectives. This resolution establishes goals for the maintenance of existing groundwater quality and requires waters that are of higher quality than the water quality objectives within a basin plan must be maintained at the higher quality. It also requires best practical control technology for discharges to high quality water, excluding injection of water into a contaminated groundwater plume. Resolution No. 92-49: "Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304" establishes policies and procedures for the investigation, cleanup, and abatement of waste. Under this resolution, dischargers are required to cleanup and abate the effects of discharges in a manner that promotes attainment of either backgroundwater quality, or the best water quality which is reasonable if background levels of water quality cannot be restored, considering all the demands being made and to be	

Source or Authority	Requirement, Standard, or Criterion	Applicable or Relevant and Appropriate	Description	Remarks
			made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible. This resolution requires the application of Title 23 CCR, Division 3, Chapter 15, Section 2550.4 (Chapter 15) requirements to cleanups. In Chapter 15, cleanup levels must be set at background levels, or if background levels are not technologically or economically feasible, then at the lowest levels that are technologically or economically achievable.	
Federal Safe Drinking Water Act	40 CFR 122 / Part 403-5; National Pollutant Discharge Elimination System (NPDES) / Publicly Owned Treatment Work (POTW)	Applicable	This act establishes NPDES permitting standards for discharge of pollutants from any point source into waters of the United States and allows municipalities to determine pretreatment standards for POTWs within its jurisdiction.	Treated groundwater from OUCTP may be discharged to waters of the State of California or the POTW. The substantive requirements of meeting effluent limitations and monitoring under a NPDES permit or discharge requirements to the POTW would be followed if such a discharge is implemented as a component of a selected remedial alternative.
California Health and Safety Code	California Toxic Injection Well Act §25159.24[a]	Applicable	Prohibits injection of contaminated water into or above a drinking water formation, but exempts injection of treated groundwater for the purpose of improving groundwater quality.	Treated groundwater from OUCTP may be injected to the aquifer to aid/accelerate the remediation process and/or dispose of extracted and treated groundwater. Injected groundwater would not contain chemical concentrations above MCLs, which are Aquifer Discharge Levels.

Source or Authority	Requirement, Standard, or Criterion	Applicable or Relevant and Appropriate	Description	Remarks
California Department of Water Resources	Water Well Standards (Bulletin 74-81)	To Be Considered	Proposes standards for construction or destruction of water wells in the State.	Wells may be constructed and/or destroyed within the OUCTP aquifers to aid/accelerate/monitor the remediation process and/or dispose of extracted and treated groundwater. These standards will be considered for new well construction and/or destruction of wells.
Criteria for All Waste Management Units, Facilities, and Disposal Sites	Title 23 CCR, Division 3, Chapter 15, Articles 1-6, Article 5, Water Quality Monitoring; Title 27 CCR Division 2, Chapters 1-6, Chapter 3, Subchapter 3, Article 1, Water Quality Monitoring.	To Be Considered	SWRCB criteria for Water Quality Monitoring and Response Programs for Solid Waste Management Units establish a "point of compliance" evaluation monitoring program where there has been a "measurably significant" evidence of a release from an unknown source.	A waste management unit has not been established at OUCTP related to the source of contamination to groundwater; however, these regulations would be considered in establishing a "point of compliance" evaluation monitoring program for management of the residual groundwater contamination within OUCTP as part of the selected remedial actions for OUCTP.
Hazardous Materials & Transportation Act	49 CFR Part 172.101	Relevant and Appropriate	These regulations impose procedures and controls on the transportation of hazardous materials.	If any drill cuttings, decontamination water, or groundwater treatment residues subsequently characterized as hazardous are generated, any such wastes will be transported according to the substantive requirements of these regulations.
California Health and Safety Code	Title 22, CCR Division 4.5	Relevant and Appropriate	The statute and regulations provide for identification of hazardous waste in §§66261. If a material is a hazardous waste, Division 4.5 provisions further regulate hazardous waste generators, transporters, and treatment, storage, and disposal facilities.	If any drill cuttings, decontamination water, or groundwater treatment residues subsequently characterized as hazardous are generated, any such wastes will be managed according to the substantive requirements of these regulations.
California Health and Safety Code	Title 22, CCR §66264.601-603	Relevant and Appropriate	These regulations apply to hazardous waste treatment conducted in a device that does not meet the definition of a "container" in 22 CCR 66260.10	If any drill cuttings, decontamination water, or groundwater treatment residues subsequently characterized as hazardous are generated, any such wastes will be managed according to the substantive requirements of these regulations.

Source or Authority	Requirement, Standard, or Criterion	Applicable or Relevant and Appropriate	Description	Remarks
			and is characterized as a "Miscellaneous Unit" subject to the provisions of 22 CCR 66264.601-603. For activities where remedial actions are not conducted using a device that meets the 22 CCR 66260.10 definition of a container, the requirements for "temporary units," as set forth in 22 CCR 66264.553 would apply.	
Land Disposal Restrictions	Title 22 CCR, Chapter 18	Relevant and Appropriate	Prohibits land disposal of specified untreated hazardous wastes and provides special requirements for handling such wastes. Requires laboratory analysis of wastes intended for landfill disposal to establish the waste is not restricted from landfill disposal.	If any drill cuttings, decontamination water, or groundwater treatment residues subsequently characterized as hazardous are generated, any such wastes will be managed according to the substantive requirements of these regulations.

APPENDIX B

COMMUNITY RELATIONS ACTIVITIES

APPENDIX B
Community Relations Activities

The following activities have been conducted as part of the Army's public relations and information transfer efforts regarding environmental restoration activities associated with the Operable Unit Carbon Tetrachloride Plume at the former Fort Ord. Presentations, briefings, and/or tours were given to the following groups or organizations, or at the following meetings.

1997

January 23	RAB Meeting
February 3	RAB Community Outreach Meeting
February 27	RAB Meeting
March 10	RAB Habitat / Outreach Committee Meeting
March 12	Cleanup Discussion w/CSUMB Students and Faculty
March 20	RAB Soil/Water/ OE Committee Meeting
March 27	RAB Meeting Publication of Winter/Spring ADVANCE environmental newsletter
April 8	Carmel Valley Rotary Club Presentation / RAB Outreach Committee Meeting
April 17	RAB Soil/Water/ OE Committee Meeting
April 18	Earth Day Information Booth, CSUMB
April 24	RAB Meeting
May 6	Marina City Council Presentation
May 20	RAB Soil/Water/ OE Committee Meeting
May 22	RAB Meeting
June 5	RAB Soil/Water/ OE / Bld & Str. Committee Meeting
June 17	Monterey Rotary Club Presentation
June 26	RAB Meeting
July 1	Press Tour
July 3	RAB Outreach Committee Meeting
July 24	RAB Meeting
August 11	RAB Soil/Water/ OE / Bld & Str. Committee Meeting
August 15	Publication of Summer ADVANCE environmental newsletter
August 19-24	County Fair Information Booth
August 21	RAB Soil/Water/ OE / Bld & Str. Committee Meeting
August 28	RAB Meeting
October 23	RAB Meeting
November 5	Marina City Council Presentation
November 20	RAB Meeting
December 3	Panel Discussion, CSUMB

1998

February 5	Public Information Meeting, CSUMB, Information Repository
February 6	Publication of Fall/Winter ADVANCE environmental newsletter
February 18	Technical Review Committee Meeting
February 28	RAB Meeting
March 10	RAB Meeting
March 11	Marina Kiwanis Club Presentation
March 18	RAB Soil/OE/B&S/Outreach Committee Meeting
April 14	RAB Meeting
May 6	RAB OE/Soil/Water/B&S Committee Meeting
May 12	RAB Meeting

May 13-14	Survey of CSUMB students in Abrams housing area
May 20	Technical Review Committee meeting
May 22	Ocean Fest information booth
May 29-31	Squid Fest information booth
June 9	RAB meeting
July 14	RAB meeting
July 29	RAB OE/Water/B&S Committee meeting
August 11	RAB Meeting
August 12	Publication of Spring/Summer ADVANCE environmental newsletter
August 18-23	County Fair information booth
August 25	Technical Review Committee meeting
September 8	RAB Meeting
September 14	Monterey Bay Marine Sanctuary Birthday information booth
September 24	RAB Water / Procedures Committee meeting
October 12	RAB meeting
November 4	Publication of Fall ADVANCE environmental newsletter
November 10	RAB meeting
November 17	Technical Review Committee meeting

1999

January 11	RAB special meeting
January 12	RAB meeting
February 8	RAB special meeting
February 9	RAB meeting
February 11	Technical Review Committee meeting
March 8	RAB special meeting
March 9	RAB meeting
May 10	Public meeting, Community Involvement
June 30	Publication of Spring ADVANCE environmental newsletter
July 7	Public meeting, Groundwater
August 17-22	Cleanup Information Booth, Monterey County Fair

2000

January 12	Community Involvement Workshop, GW
January 31	Published 9th edition of Cleanup Newsletter *Advance*
March 8	Presentation, Marina Chamber of Commerce
March 25	Cleanup Open House
April 18	TRC
April 26	Information table, CSUMB, Earth Day
May 5-7	Information booth, Marina Festival of the Winds
May 20	Published 10th edition of Cleanup Newsletter *Advance*
June 9	Tour for FORA members
June 19	Community Involvement Workshop, Groundwater Update
July 17	Release CRP Update 1 Final
August 15-20	Information Booth – Monterey County Fair
August 19	Information Table – CSUMB New Student/Parents Orientation Day
August 23	Information Table – CSUMB Campus Fair
September 22	Presentation to Marina City Council – Carbon Tetrachloride Groundwater Contamination
October 3	Presentation to Marina City Council Meeting – Carbon Tetrachloride Groundwater Contamination
October 11	Community Involvement Workshop, Carbon Tetrachloride Contamination Plume

October 12	Technical Review Committee, Carbon Tetra Chloride Contamination Plume
October 14	Marina City Air Faire, Information Booth
October 25	Presentation to the Marina Coast Water District Public Meeting - Carbon Tetrachloride Groundwater Contamination
October 26-Nov 3	Door-to-Door notice of carbon tetrachloride groundwater contamination to residences
November 16	Presentation to Marina City Council Meeting – Carbon Tetrachloride Groundwater Contamination
November 23	Presentation to Marina City Council Meeting – Carbon Tetrachloride Groundwater Contamination

2001

January 3	Distribution of 370 Spanish and 245 Korean translations of the carbon tetrachloride groundwater contamination in vicinity of the City of Marina to Marina residents, businesses and agencies. Published 11th edition of Cleanup Newsletter
January 20	Third annual cleanup open house
January 25	Tour of surrounding communities for USEPA intern environmental justice studies
February 20	Presentation to Marina City Council – Carbon Tetrachloride Plume update
February 21	Community Involvement Workshop – Landfill Gas, Groundwater, Unexploded Ordnance Removal
February 22	Technical Review Committee Meeting - Landfill Gas, Groundwater, Unexploded Ordnance Removal
March 7	Presentation to Marina Rotary Club – Carbon Tetrachloride Groundwater Pollution
March 8	Presentation to students of Monterey Institute of International Studies – Project Status
March 19	Newspaper and television Interview of Marina resident student who won first place in Monterey County Science Fair with a groundwater contamination project based on Fort Ord Carbon Tetrachloride groundwater contamination investigation. Assistance from Army POM and contractor staffs
March 23	Tour and cleanup update to Hartnell College students Begin CRP Update 2001 interview scheduling and survey
April 4	Mail 23,000 invitations to interview for CRP Update 2001
April 18	Presentation to Salinas Valley Business Woman's Network Published 12th edition of Cleanup Newsletter Information table – CSUMB Earth Day observance
April 30	Received 175 CRP Update surveys and completed 21 interviews of interested community members
May 11-14	Door-to-Door well drilling notice to residents in vicinity Preston Park and the City of Marina
May 12- 14	Information table at Marina Festival of the Winds
May 23	POM Safety Day
June 13	Community Involvement Workshop – Announcement of the Interim Action OE RI/FS, Groundwater Update, Landfill Gas Update
July 17	Cleanup presentation to the Coalition of Homeless Services Providers (local non-profit)
July 31	Tour for CSUMB Environmental Health and Safety Conference attendees
August 1	Cleanup presentation to Monterey Realtors Association Mailed self-addressed, postage-paid envelopes with an invitation to comment on the cleanup to entire community relations mailing list Presentation to CSUMB Environmental Health and Safety Conference attendees
August 7-12	Information Booth, Monterey County Fair
August 15	Published and mailed 13th edition of Cleanup Newsletter

October 17	Presentation to Monterey County Realtors Association
October 23	Presentation to Kiwanis Club, Monterey
October 29	Presentation to MPC students, Monterey
November 20	Cleanup discussion w/ CSUMB communication class

2002

January 12	Fourth Annual Open House
February 7	Technical Review Committee - Site Security, OE Activities, IA OE RI/FS, GW, LFG
February 28	Mailing 2-02 CIW summary, 3-25/26 public meeting announcement and ground rules
March 11	Distributed Community Bulletin #3
March 18	Mailing February 2002 Document Update and 3-25/26 Public Meetings Announcement
May 11-12	Information Table, Marina Wind Festival
June 15	Open House
June 20	Presentation Preston Resident's Assn., CTA Investigation
July 10	CIW, Groundwater Cleanup Update
August 13-18	Information Table, Monterey County Fair
August 16	Construction Fair
August 23	Information Table, CSUMB
October 24	Presentation to Seaside Lion's Club

2003

January 14	Community Involvement Workshop (CIW) Landfill Gas, Health Risk, Groundwater
January 15	Technical Review Committee Meeting
February 8	Presentation to Preston Park Tenants Assoc. Carbon Tetrachloride RI/FS Activities
February 22	Open House
March 30	Association of Environmental Professionals Tour and Presentation
April 3	Monterey Peninsula College, Environmental Class, Cleanup Presentation
April 7	Agency for Toxic Substances and Disease Registry (ATSDR) Meeting
May 10-11	Information Booth at the Marina Festival of the Winds
May 22	Information Booth at the POM Safety Stand Down
May	Published and Mailed Community Bulletin #5 to Monterey Bay-Salinas Valley Households
June 21	Environmental Cleanup Open House
July	Published and Mailed Community Bulletin #6 to Monterey Bay-Salinas Valley Households
July 8	Community Involvement Workshop
July 9	Technical Review Committee
August 12-17	Information Table at the Monterey County Fair
August 26	Information Table at CSUMB Student Orientation
September 16	Fort Ord Reuse Authority – USEPA Cleanup Tour

2004

January 9	Door-to-Door Notification of Carbon Tetrachloride in Soil Gas distribution focus on Lexington Court and Ready Court
January 13	Community Involvement Workshop
January 14	Technical Review Committee
February 21	Fort Ord Cleanup Open House
February 28	Door-to-door distribution of Carbon Tetrachloride Treatment system construction (Lexington, Stewart, and Ready Courts)
March 16	Community Involvement Workshop
April 7	Community Involvement Workshop

April 8	Fort Ord Community Advisory Group
April 21	Fort Ord Cleanup Presentation – Notre Dame High School, Salinas
April 21	Environmental Information Booth – CSUMB Earth Day Celebration
April 22	Fort Ord Cleanup Presentation – Association of Environmental Professionals – Monterey Bay Chapter
May 8-9	Marina Festival of the Winds
May 27	Information booth at Safety Stand Down – Presidio of Monterey
May 27	Information booth at Safety Stand Down – Ord Military Community
June	Distribution of Community Bulletin 7
June 12	Guided Tours of the Fort Ord Cleanup
June 24	Cleanup Presentation to Environmental Planners
July 13	Community Involvement Workshop
July 14	Technical Review Committee
August 9	Door-to-door Distribution of the Construction Update – Carbon Tetrachloride Fact Sheet for Stewart and Ready Courts in Preston Park.
August 12	Participation at the Fort Ord Community Advisory Group public meeting
August 17-22	Information Booth at the Monterey County Fair
August 25	Groundwater Cleanup Presentation – Marina Coast Water District
August 30	Door-to-door distribution in Eucalyptus and Modern Lane in Marina for off post well drilling
September 16	Participated in the Fort Ord Community Advisory Group Public Meeting
October 13	Technical Review Committee
October 21	Environmental Bus Tour – Forest Hill Manor
October 27	California State University Monterey Bay ESSP Science Class bus tour
November 8	Army Participation at the Fort Ord Community Advisory Group
November 18	Environmental Bus Tour – Forest Hill Manor
November/December	Community-wide distribution of Community News
December	Fact Sheet distribution for the drilling activities at Bunker Hill Road

2005

January 5	Community Involvement Workshop
January 6	Technical Review Committee
February 26	Held an open house with guided tours for the Fort Ord Cleanup
April 1	Tour for the Monterey County Health Department
April 12	Attended Fort Ord Community Advisory Group meeting
April 21	Booth at Californian State University Monterey Bay Campus Earth Day
May 7	Booth at the Marina Festival of the Winds
May 10	Attended Fort Ord Community Advisory Group meeting
June 4	Cleanup presentation to community group "Marina on the Move"
June 11	Open House / Bus Tour
July 21	Community Involvement Workshop
July 22	Technical Review Committee
July 27	Groundwater Cleanup Tour for the Monterey County Health Department
August 9	Attended Fort Ord Community Advisory Group meeting
August 16-21	Monterey County Fair Cleanup Information Booth
August 30	Attended Fort Ord Community Advisory Group meeting
September 30	Retired Fort Ord Soldiers Reunion—Environmental Cleanup Tour
October	Distribution of 51,000 Fort Ord Newsletters
October 11	Attended Fort Ord Community Advisory Group meeting
October 12	Groundwater Cleanup Presentation for the Marina Coast Water District
December	Distribution of the Winter Fort Ord News to 51,000 households

2006

January 11	Fort Ord Community Advisory Group presentation
January 12	Community Involvement Workshop
January 15	Technical Review Committee
January 26-27	Fort Ord Cleanup tours for faculty and staff of Monterey Peninsula College
February	Distribution of Proposed Plan to 51,000 Monterey Bay – Salinas Valley households
February 22	Open House for Californian State University at Monterey Bay
February 25	Open House / Bus Tour for the Monterey Bay Salinas Valley community
March 6	Door to Door Distribution of Well Construction Fact Sheet in Fredrick Park
March 10	Cleanup tour for the Widows and Widowers of Fort Ord Club
May	Distribution of Fort Ord Annual Report to 51,000 Monterey Bay - Salinas Valley
May 13-14	Marina Festival of the Winds
May 15	Cleanup presentation at Monterey High School
May 24	Cleanup Tour for officials from Republic of China Environmental Protection Agency
June 10	Open House / Bus Tour for the Monterey Bay Salinas Valley community
July 27	Cleanup presentation at City of Marina Planning Commission